

**FINAL ENVIRONMENTAL ASSESSMENT FOR
UPGRADING THE MILITARY OPERATIONS IN URBAN
TERRAIN (MOUT) TARGET ARRAYS
AT AVON PARK AIR FORCE RANGE, FLORIDA**

July 2008



**Prepared by the
Environmental Flight
Avon Park Air Force Range, Florida**

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Cover Sheet

ENVIRONMENTAL ASSESSMENT

Upgrading the Military Operations in Urban Terrain (MOUT) Arrays at
Avon Park Air Force Range, Florida

- a. *Responsible Agency:* United States Air Force (USAF)
- b. *Proposals and Actions:* The AF proposes to upgrade two military targets in urban terrain (MOUTs) in two separate training ranges. These MOUTs are mock urban villages that afford military training in urban settings. The upgrades entail more intensive site preparation and new building and road construction for the MOUT located in a northern range, while disking operations would occur for the MOUT located in a southern range. These upgrades would result in both MOUTs having more urbanized settings than their original design.
- c. *For Additional Information:* Contact Mr. Paul Ebersbach, Chief Environmental Flight at telephone number (863 452-4119) or e-mail at paul.ebersbach@avonpark.macdill.af.mil
- d. *Designation:* Environmental Assessment
- e. *Abstract:* This environmental assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA). The process focused on the following environmental resources: airspace and aircraft operations, safety, water, geology and soils, vegetation, invasive species, fire management, grazing, forestry, fish and wildlife to include threatened and endangered species, recreation, military training, cultural resources, and coastal zone management. The Proposed Action would upgrade two existing MOUTs, called the North and South MOUTs. The North MOUT upgrade would entail intensive site preparation by clearing the construction site to bare mineral soil, constructing new buildings, new roads, and a stormwater drainage system. After construction, natural re-vegetation would occur near the new buildings and roads and the vegetation would be mowed once or twice annually. Twenty-six acres over the next 20 years could be urbanized in this manner. Construction would begin in 2008 or later. The South MOUT, approximately eight acres in size, would be disked once or twice annually. No additional roads or buildings would be added. The Alternative Action would be the same as the Proposed Action except that the North MOUT would be seeded with a tame pasture grass in the spaces between buildings and roads after the construction would be completed. Two preceding EAs previously established the construction and military training in both MOUTs. Therefore, the No-Action alternative would default back to the selected Proposed Actions of these EAs. This would result in constructing new buildings in the North MOUT and continued military training in both MOUTs. For the North MOUT, building construction would disturb the ground only within the dimensions of each new building, no new roads would be constructed, and the vegetation would not be mowed. The South MOUT would not be disked.

The Proposed Action is recommended because it would provide for optimal safety for military personnel training in the MOUTs and rely on native plants to stabilize the soils after construction.

FINDING OF NO SIGNIFICANT IMPACT

The Environmental Flight at Avon Park Air Force Range (APAFR) has prepared an environmental assessment (EA). This analysis was conducted in accordance with the *Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act* (40 CFR Part 1500-1508, 1 July 2006) and the *Environmental Impact Analysis Process* (32 CFR 989, 1 July 2007).

1.0 NAME OF ACTION – Upgrading Military Operations in Urban Target (MOUT) Arrays.

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 Proposed Action

There are two existing urban villages termed the North and South MOUTs. The North MOUT occupies 26 acres and has much expansion potential. The Proposed Action would employ worksite clearing to mineral soil for each expansion as they would occur over the next 20 years. The first expansion is desired in 2008, but could start later. Vehicles in convoy as well as personnel on foot would use the roads in military training scenarios. Personnel would also occupy the buildings. The South MOUT, about eight acres in size, would not be expanded with new buildings, but would be disked once or twice annually to fill in ordnance craters and clear vegetation.

2.2 Alternative Action

The Alternative Action would be the same as the Proposed Action, except that the North MOUT would be seeded with a pasture grass after construction each time the MOUT would be expanded. The South MOUT would continue to be disked.

2.3 No-Action Alternative

The No-Action alternative would expand the North MOUT, but with minimal surface disturbance, no road construction, and no stormwater controls. Personnel would only occupy buildings that are already in existence and vehicles would only use existing roads. Personnel would not occupy new buildings. The South MOUT would not be disked.

3.0 SUMMARY OF ENVIRONMENTAL IMPACTS

Airspace and Aircraft Operations

While the MOUTs typically provide intensive training settings for aircraft operations and coordination of airspace, none of the actions would change or impact airspace. Aircraft operations would slightly increase over the MOUT locations for the Proposed and Alternative Actions.

Safety

The Proposed and Alternative Actions would provide safe, concrete buildings to train in the North MOUT. Training risks would be slightly increased due to additional roads with vehicles and pedestrians interfacing within the North MOUT. For the South MOUT,

safety would be improved by filling in ordnance craters by disking.

The No-Action alternative would result in constructing unstable, concrete buildings in the North MOUT that personnel could not train in, on, or immediately around. Vehicles would be limited to four existing roads, thus reducing risk of vehicle/pedestrian interface. The South MOUT would pose minor safety concerns for personnel on foot because of existing ordnance craters.

Water Resources

The area downslope of the North MOUT experiences accelerated stormwater runoff due to previous construction located below the North MOUT. The North MOUT currently accelerates erosion to a minor extent as well. The Proposed Action would decrease stormwater runoff in this area by up to ten percent if the North MOUT were fully developed. Decreased runoff would be due to the construction and maintenance of stormwater detention ponds. The Alternative Action could reduce stormwater runoff slightly more if a pasture grass were successfully established. The No-Action alternative would neither increase or decrease the rate of accelerated stormwater runoff.

For all actions, the water table would continue to drop immediately adjacent to a gully that is progressing uphill towards the North MOUT.

The North MOUT is located in the Morgan Hole Creek watershed. Water quality for Morgan Hole Creek is not expected to improve or degrade with any of the actions.

Changes in water quality or stormwater runoff would not be expected for the South MOUT for any action.

A stormwater runoff pollution prevention plan submitted to the Florida Department of Environmental Protection would be required for the Proposed and Alternative Action any time more than one acre of ground would be disturbed for construction.

Geology and Soils

For the North MOUT, the Proposed and Alternative Actions would permanently increase the soil pH and compact soils by adding road base for the North MOUT road network. The Alternative Action would further increase pH by adding lime and change soil chemistry by adding fertilizer. Soil erosion would increase on site, but would be captured off-site in detention ponds. Soil erosion may be slightly lower with the Alternative Action if the pasture grass were to establish. The No-Action alternative would have minor changes to soil pH and compaction and not increase soil erosion.

A gully located down slope of the North MOUT would be expected to continue to erode towards the North MOUT under all actions.

The South MOUT would have soil composition changes with continuous disking under the Proposed and Alternative Actions. The No-Action alternative would have some changes in composition due to ordnance deliveries, but to a lesser extent.

Vegetation

Native vegetation would be lost where disked to mineral soil in both MOUTs and replaced by weedy plant species under the Proposed Action. Even though the soil would not be continuously disked in the North MOUT, influences by the road network, foot traffic, and mowing would result in some weedy plant species. Some of the weedy species could detract from ground training due to seed spurs. The Alternative Action could result in a pasture grass being established and possibly resulting in fewer weedy species for the North MOUT. However, because the soils are droughty, the success of establishing a pasture grass would be minimal. Weedy species would persist in the South MOUT. The No-Action alternative would keep most native vegetation intact in both MOUTs.

Invasive Plant Species

Noxious weeds that require treatment for control currently do not exist in the MOUTs, but would have a greater likelihood of establishing under the Proposed and Alternative Actions due to soil disturbance, changes in soil pH and a road network providing spread of weed seeds by way of vehicles. The Alternative Action would somewhat reduced risk of noxious weeds establishing if a pasture grass formed a protective sod for the North MOUT. The No-Action alternative would have the least potential of having noxious weeds establish. Because the MOUTs are frequent training sites with vehicles, if noxious weeds were to establish in them, they would become major vectors for further weed spread to other locations on the installation. For this reason, aggressive noxious weed management within the MOUTs would be required. Because the MOUTs are either in or near federally listed threatened and endangered animal species habitat, the emphasis for weed control in the MOUTs would be strong.

Grazing Management

The Alternative Action would provide a minor benefit to cattle by providing a pasture grass for grazing. The other alternatives would not impact the grazing program.

Forestry

While a remnant pine plantation is near the North MOUT, it is not managed for forest products. The forestry program would not be impacted by any of the actions.

Fish and Wildlife

Some wildlife species would be displaced by upgrading the MOUTs.

Informal consultation with the United States Fish and Wildlife Service (USFWS) was conducted for the Proposed Action. The consultation resulted in the USFWS concurrence of may affect, not likely to adversely affect, the federally threatened Florida scrub-jay, threatened red cockaded woodpecker, threatened eastern indigo snake, and federally endangered Florida grasshopper sparrow. Conservation measures entailed training all ground personnel involved with the construction, maintenance, and use of the MOUTs to identify and avoid the eastern indigo snake, excavation of tortoise burrows and relocation of tortoises when burrows could be avoided due to construction or maintenance and indigo snakes encountered during excavation would be allowed to leave

on their own volition. Exotic, invasive weeds established in the MOUTs would be herbicided for eradication.

The Alternative Action would require reconsultation with the USFWS. Affects and conservation measures would be expected to be the same.

Under the No-Action alternative, consultation with the USFWS would not necessarily be required if building placement could avoid gopher tortoise burrows. The South MOUT would not require consultation with the USFWS.

Recreation

While recreational game species occupy the MOUTs, the recreating public is not allowed access to them because they are in ordnance impact ranges. Recreation would not be impacted.

Military Training

The Proposed and Alternative Actions offer optimal military training. The No-Action Alternative offers the least opportunities for military training.

Cultural Resources

Cultural Resources were previously surveyed for in the project areas. The Air Force determined no impacts to cultural resources. Consultation with tribal leaders and the State Historic Preservation Officer was initiated. Concurrence of no impact was received by the Miccosukee Tribe of Indians, the Seminole Nation of Oklahoma, and the Florida State Historic Preservation Officer.

Coastal Zone Management

The Proposed Action, Alternative Action, and No-Action alternative would be in compliance with the Florida Coastal Zone Management Plan and would have no adverse affects on coastal zones.

Short-Term Use/Long Term Productivity

For all actions, upgrading the North MOUT would result in some down time for the respective training range where the North MOUT is located. Other ranges would likely be available for training. Long term, both MOUTs, especially the North MOUT, would allow for a more urban environment, especially under the Proposed and Alternative Actions.

Irreversible and Irretrievable Commitment of Resources

Fossil fuels would be expended during construction for all alternatives that could not be recovered.

For the North MOUT, irreversibly impacts to soil and native vegetation would be expected for the Proposed and Alternative Actions.

For the South MOUT, continued disking would result in the irreversible loss of native flora and fauna communities for the Proposed and Alternative Actions.

Cumulative Impacts and Direct and Indirect Effects

The South MOUT is located in the endangered Florida grasshopper sparrow's (FGS) habitat. Much of the FGS historical habitat has been lost within APAFR. Under the Proposed and Alternative Actions, continuous disking would eliminate the south MOUT from this habitat. The No-Action alternative would retain some plant species of this habitat.

For the Proposed and Alternative Actions, both MOUTs would increase the risk of exotic, noxious weed species establishing within them and then being transported to other locations of installation. Noxious weeds spreading in endangered species habitat would be serious concern. The No-Action alternative would not increase or reduce the likelihood of noxious weeds spreading.

Comparison of Actions

The Proposed and Alternative Actions would create safe buildings for ground personnel to train in, on, and around in the North MOUT. The No-Action alternative would create unstable and unsafe buildings that ground personnel would consciously have to avoid.

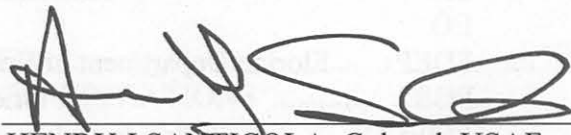
The Proposed and Alternative Actions would raise the pH of the soil and increase soil compaction for the North MOUT. Both would also produce an environment that would increase the risk of exotic, invasive weeds establishing; the Alternative Action having less risk if a pasture grass sod would be established. The No-Action alternative would not change soil pH and minimally compact soils. The No-Action alternative would have the least risk for noxious weeds to establish.

4.0 FINDING OF NO SIGNIFICANT IMPACT

The attached EA was prepared and evaluated pursuant the National Environmental Policy Act (Public Law 91-190, 42 U.S.C. 4321 et seq.) and IAW CFR 32-989 *The Environmental Impact Analysis Process*. Based on the analysis presented in this EA, the Proposed Action of land clearing to construct buildings, creating roads, and establish detention ponds in the North MOUT and continuous disking soil in the South MOUT at Avon Park Air Force Range, Florida does not constitute a "major Federal action significantly affecting the quality of the human environment" when considered individually or cumulatively in the context of the referenced act, including both direct and indirect impacts. Also, there are no mitigation measures necessary to implement the Proposed Action. An Environmental Impact Statement (EIS) will not be prepared.

31 Jul 06

Date



HENRY J SANTICOLA, Colonel, USAF
Chairperson EPC

ACRONYMS AND ABBREVIATIONS

ACC	Air Combat Command
AFI	Air Force Instruction
AIRFA	American Indian Religious Freedom Act
APAFR	Avon Park Air Force Range
BDU	bomb dummy unit
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
DOPAA	description of proposed and alternatives
EA	environmental assessment
EIS	environmental impact statement
EO	Executive Order
FDEP	Florida Department of Environmental Protection
FGS	Florida grasshopper sparrow
FFWCC	Florida Fish and Wildlife Conservation Commission
FSJ	Florida scrub-jay
FONSI	finding of no significant impact
IAW	in accordance with
L_{dnmr}	monthly day-night average sound
Mk	mark – a concrete filled dumb bomb
MOUTS	military operations in urban target
NAGPRA	Native American Graves Protection Act
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NRIS	National Register Information System
ORM	Operational Risk Management
RCW	red-cockaded woodpecker
RRPR	reduced range practice rocket
SHPO	State Historic Preservation Officer
TACP	tactical air controller party
US	United States
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
WG	wing

TABLE OF CONTENTS

1.0 PURPOSE OF AND NEED FOR ACTION	1
1.1 INTRODUCTION	1
1.2 PURPOSE	3
1.3 NEED	3
2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES	6
2.1 PROPOSED ACTION	6
2.2 ALTERNATIVE ACTION	11
2.3 NO-ACTION ALTERNATIVE	12
2.4 REQUIRED PERMITS AND COORDINATION.....	12
2.5 ACTS AND EXECUTIVE ORDERS NOT APPLICABLE.....	13
3.0 AFFECTED ENVIRONMENT	14
3.1 AIRSPACE AND AIRCRAFT OPERATIONS	14
3.2 SAFETY	14
3.3 WATER RESOURCES	15
3.4 GEOLOGY AND SOILS	20
3.5 VEGETATION	21
3.6 INVASIVE PLANT SPECIES	23
3.7 FIRE MANAGEMENT	23
3.8 GRAZING MANAGEMENT	24
3.9 FORESTRY	24
3.10 FISH AND WILDLIFE	24
3.11 RECREATION	27
3.12 MILITARY TRAINING	28
3.13 CULTURAL RESOURCES.....	29
3.14 COASTAL MANAGEMENT	30
4.0 ENVIRONMENTAL CONSEQUENCES	31
4.1 AIRSPACE AND AIRCRAFT OPERATIONS	31
4.2 SAFETY	31
4.2.1 Proposed and Alternative Actions.....	31
4.2.2 No-Action Alternative	31
4.3 WATER RESOURCES	32
4.3.1 Proposed Action	32
4.3.2 Alternative Action.....	32
4.3.3 No-Action Alternative	32
4.4 GEOLOGY AND SOILS	32
4.4.1 Proposed Action	32
4.4.2 Alternative Action	33
4.4.3 No-Action Alternative	33
4.5 VEGETATION	33
4.5.1 Proposed Action	33
4.5.2 Alternative Action	33

4.5.3 No-Action Alternative	35
4.6 INVASIVE PLANT SPECIES	35
4.6.1 Proposed Action	35
4.6.2 Alternative Action	35
4.6.3 No-Action Alternative	35
4.7 FIRE MANAGEMENT	36
4.8 GRAZING MANAGEMENT	36
4.8.1 Proposed Action	36
4.8.2 Alternative Action	36
4.8.3 No-Action Alternative	36
4.9 FORESTRY	36
4.10 FISH AND WILDLIFE	36
4.11 RECREATION	37
4.12 MILITARY TRAINING	37
4.13 CULTURAL RESOURCES	38
4.13.1 Proposed Action	38
4.13.2 Alternative Action	38
4.13.3 No Action Alternative	38
4.14 COASTAL ZONE MANAGEMENT	38
4.15 SHORT TERM USE/LONG TERM PRODUCTIVITY	38
4.16 IRREVERSIBLE/IRRETREIVABLE COMMITMENT OF RESOURCES	39
4.17 CUMMULATIVE IMPACTS WITH DIRECT AND INDIRECT EFFECTS ..	39
4.18 COMPARISION OF ACTIONS	41
5.0 LITERATURE CITED	43
6.0 NATIONS, AGENCIES, AND PUBLICS CONTACTED	46
7.0 LIST OF PREPARERS	48
8.0 RECORD OF CORRESPONDANCE	49
9.0 RECORD OF RESPONSES TO COMMENTS ON DRAFT EA	74
APPENDIX A: CALCULATION OF DEVELOPMENT OF THE NORTH MOUT	
APPENDIX B: APAFR HAZARD SAFETY MODEL	
APPENDIX C: REPORT ON STORM WATER EROSION AND CALCULATIONS	
APPENDX D: NORTH AND SOUTH MOUT THREATENED AND ENDANGERED ANIMAL PRELIMINARY SURVEY	

LIST OF FIGURES

Figure 1.1-1 Avon Park Air Force Range’s location in Florida	2
Figure 1.2-1 The location of the North and South MOUTs.....	4
Figure 2.1-1 The building and road expansion in the North MOUT	7
Figure 2.1-2 The North MOUT with the proposed stormwater runoff system.....	8
Figure 2.1-3 Disked area of the South MOUT	10
Figure 3.3-1 Avon Park Air Force Range over the surficial aquifer	16
Figure 3.3-2 The North MOUT location in the subset watersheds.....	17
Figure 3.3-3 The water flow pattern of the North MOUT	19
Figure 3.10-1 Florida grasshopper sparrow inventories 1996-2007	26
Figure 3.10-2 Florida grasshopper sparrow inventory 2008.....	27

LIST OF TABLES

Table 2.1-1 The amount of ordnance expanded annually for the semiannual JIFE	11
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1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

Avon Park Air Force Range (APAFR) is located in Polk and Highlands Counties in Central Florida (Figure 1.1-1). The range complex covers approximately 106,073 acres and is about 10 miles east of Avon Park and 15 miles northeast of Sebring, Florida. The major highways serving the range are US Highway 27 and State Route 64. APAFR is the largest bombing and gunnery range east of the Mississippi River. The mission of APAFR is to provide a training infrastructure that allows US air and ground forces to practice the latest combat training techniques and procedures safely, efficiently, and realistically and to design training facilities that meet training needs. The 23rd Wing at Moody Air Force Base, Georgia, is responsible for the operation and maintenance of APAFR, which is assigned to Air Combat Command (ACC). The range is used for bombing practice by US Air Force units from throughout the southeast.

Three urban villages were constructed at APAFR during 2001. Prior to construction, the three construction sites were located in operational and environmentally optimal areas and assessed under the environmental assessment (EA) titled, *Final Environmental Assessment for Construction of Military Operations in Urban Terrain Target Arrays at Avon Park Air Force Range, Florida* (USAF 2001) (hereafter referred to as the construction EA). A finding of no significant impact (FONSI) was determined and the villages (hereafter referred to as MOUTs) were constructed. The MOUTs were modeled after combat experience in Bosnia that called for precision air-to-ground ordnance drops on military vehicle targets while avoiding collateral damage to buildings. To a lesser degree, the villages were designed for non-precision guided air-to-ground and ground-to-ground ordnance coordinated with inserted ground troops consisting of tactical air control parties (TACPs).

With the onset of military conflict in Afghanistan and Iraq, military trainers realized that the MOUTs were deficient in simulating current combat situations. Physically, the MOUTs lacked the building density as typically found in the Middle East and lacked nonmetal building materials. Tactically, the MOUTs were deficient in training for ground troops. Not only were TACPs involved on the ground, combat support troops and convoys played a role in urban settings as well. No longer were opposition forces only in military vehicles a good distance away from friendly forces as in Bosnia; opposition forces were now exchanging small arms fire with friendly forces while in well defended urban buildings that required precision guided air-to-ground ordnance drops on the buildings themselves.

Therefore, the MOUT located in the North Tactical Range (here after referred to as the North MOUT) was reconfigured physically and operationally. Physically, a 26 acre area was delineated around the existing North MOUT. Additional buildings could be added anywhere and existing buildings moved anywhere within the 26 acres to create the density and configuration desired for an indefinite period of time. The buildings could be made of large, stacked concrete blocks with flat wooden roofs as well as the existing sea

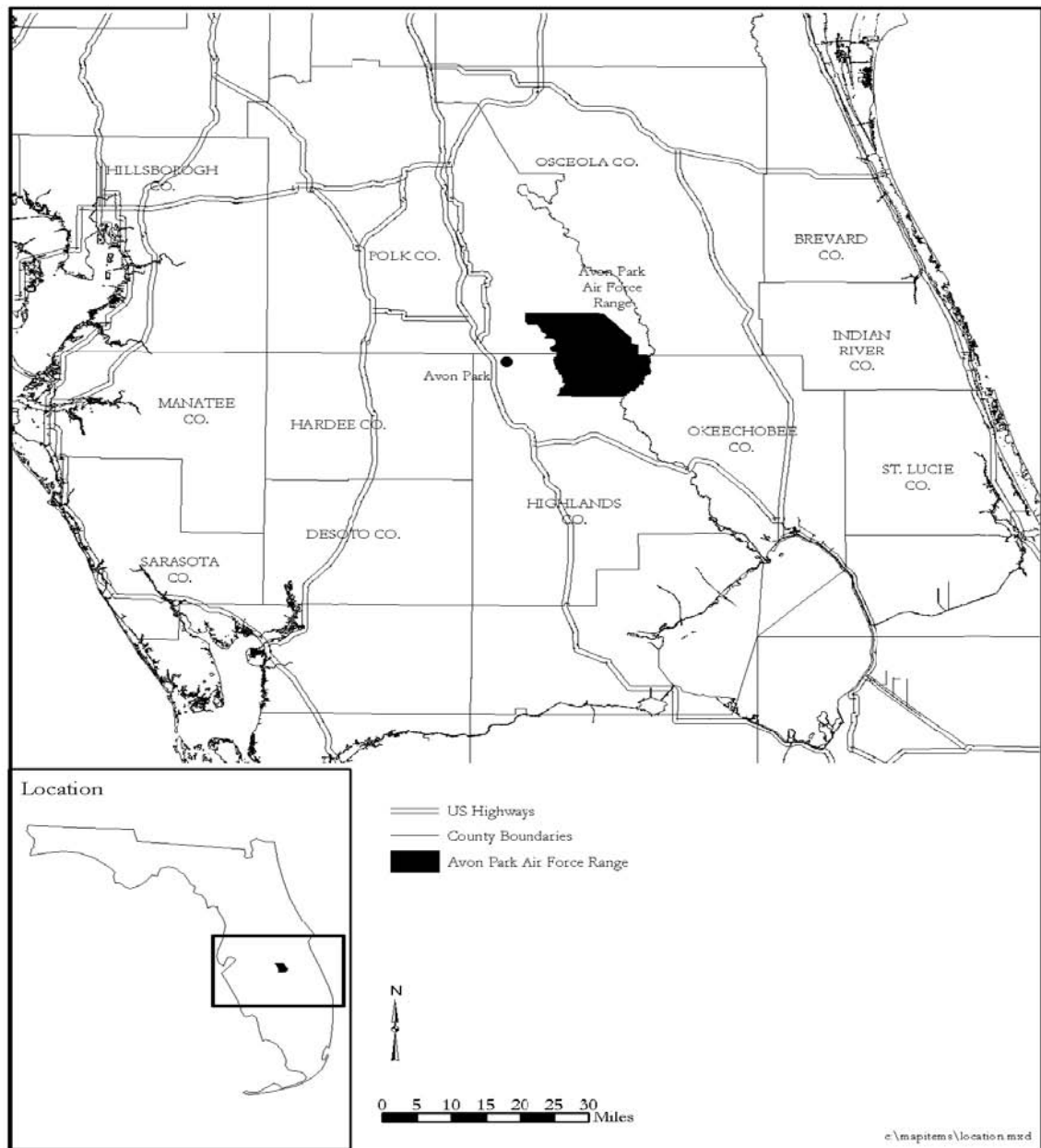


Figure 1.1-1 Avon Park Air Force Range's location in Florida.

land container conex boxes made of metal. The concrete buildings could be occupied by training personnel. Operationally, small arms live fire and vehicle mounted, crew served weapons were added as well as pop-up targets. Two metal conex buildings could now be targeted with ordnance. The *Final Environmental Assessment for Expanding the North Military Operations in Urban Terrain (MOUT) Target Array at Avon Park Air Force Range, Florida*, (USAF 2005) (hereafter referred to as the expansion EA) assessed expanding the North MOUT and resulted in a FONSI. The urban village was expanded by adding and relocating buildings in February 2005 and in January 2006.

1.2 Purpose

The purpose of the Proposed and Alternative actions is to primarily upgrade the North MOUT by providing intensive site preparation for new building and road construction over the 26 acre area designated for North MOUT expansion. A secondary purpose is to conduct maintenance disking around the MOUT located in the South Tactical Range (hereafter referred to as South MOUT). See Figure 1.2-1 for the location of these MOUTs on APAFR.

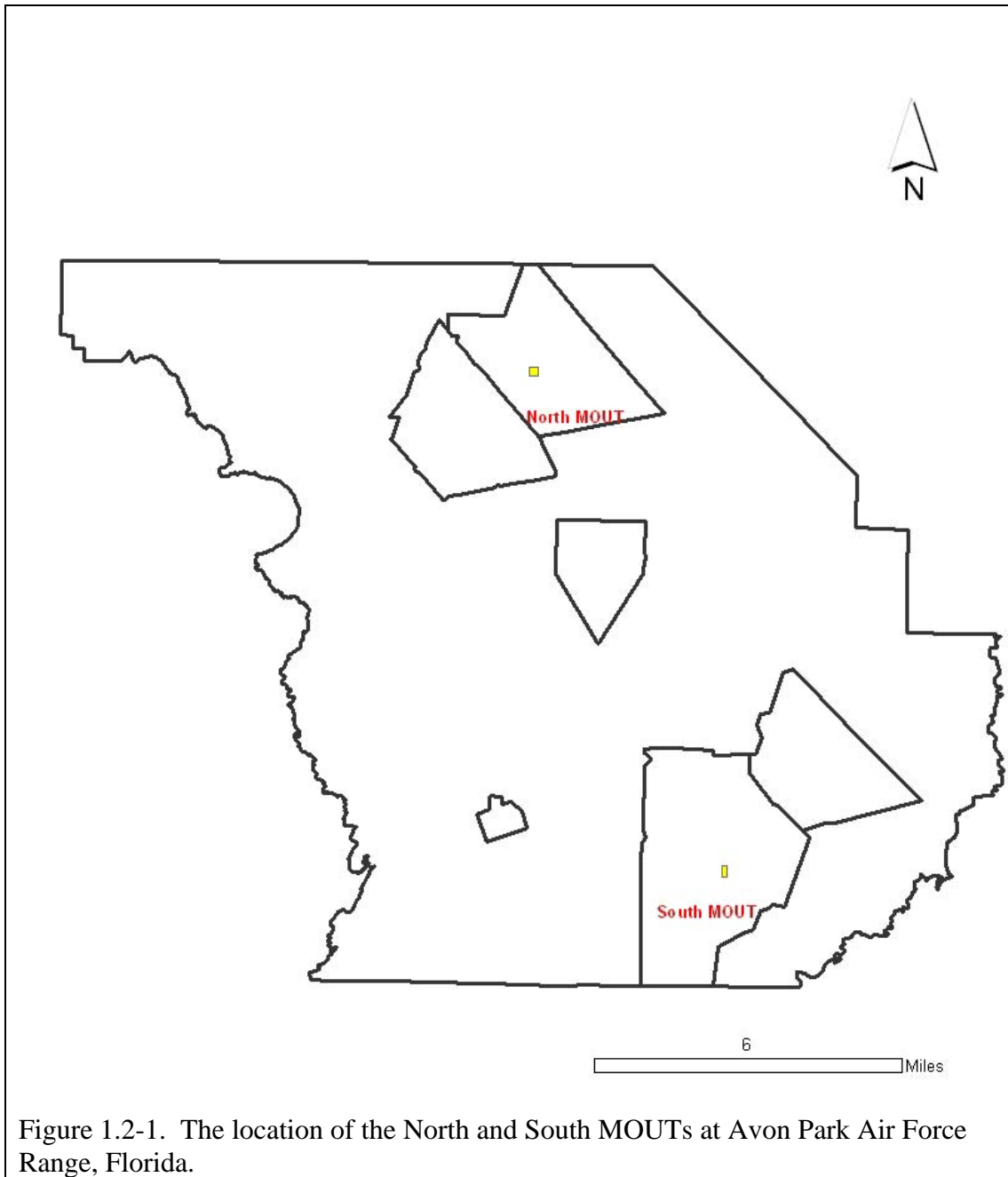
1.3 Need

The current expansion concept as described by the expansion MOUT EA minimized site preparation for the North MOUT to only the physical dimensions of a new or relocated building itself. No secondary roads were created. Four existing unimproved roads that formed a four way intersection were used. The result was the appearance of a village in a field. The appearance was intentional under the expansion concept because it minimized soil erosion by retaining as much native vegetation as possible, retained a wildfire regime with native vegetation, and minimized the risk of noxious weeds establishing by minimizing disturbance. Ultimately, the expansion concept was found deficient for the North MOUT because:

- The concrete block buildings could not be stabilized when built on minimally cleared sites. This was a critical safety concern for personnel who would be entering the buildings during training as part of an exercise or personnel placing pop-up targets in the buildings in preparation for a training scenario. Therefore approximately five acres were disked to mineral soil prior to building placement.
- Access to the North MOUT for training and target maintenance was not possible by the unimproved access road entering the North MOUT from the south. This road was therefore improved by adding shell/clay and elevating the road for greater stability. Improving the road in this manner was approved through the Air Force Form 813 *Request for Environmental Impact Analysis* and determined as no significant environmental impact and documented as a categorical exclusion.
- Tall weeds established and obstructed visibility during training and created less of an urbanized appearance. This also occurred for the South MOUT.
- Vehicle convoys moving through a hostile village or vehicle assaults on a village down one main road were not doctrinally reasonable. Vehicles would not travel down a main road in a village – they would be too susceptible to previously placed improvised explosive devices and preposition enemy forces armed with rocket propelled grenades and small arms.

The short comings of the expansion concept have resulted in the following:

- The North MOUT expansions during February 2005 and January 2006 resulted in more disking of the soil than the footprint of the new buildings as assessed in the expansion EA. About five acres were disked. The additional disking was done so



- that the buildings could be sufficiently stabilized. Native vegetation outside of the immediate dimensions of the buildings did recover from the disking, albeit in an earlier seral stage with plant species that favor disturbance. This area is still recovering.
- While training, some vehicle convoys have not followed the established roads and have traveled cross-country within the perimeter of the village. Vehicle paths are beginning to be visible.

- Portions of the North MOUT have been mowed to improve the urbanized look, improve visibility, and to improve vehicle accessibility for building/target maintenance.
- Although not proposed or assessed in the construction or expansion EAs, the entire South MOUT, approximately eight acres, was disked during the winter of 2007 and 2008. The recovering vegetation is in an early seral stage of recovery. More buildings were added in 2007 for a greater urbanization effect.

The need identified in the Proposed and Alternative Action in this EA for the North MOUT would be for extensive site disking to ensure building safety for personnel and the development of alternative roads for vehicle training to avoid cross-country travel, yet allow multiple entry points and travel routes within the North MOUT to meet tactical training objectives. Both the Proposed and Alternative Actions would result in the North MOUT having a more urban setting.

The need for disking the South MOUT is to maintain an urban appearance by reducing vegetation. Also, heavy ordnance is dropped in the South MOUT that creates large craters. Disking would fill in the craters.

Both the *Final Environmental Assessment for Construction of Military Operations in Urban Terrain Target Arrays at Avon Park Air Force Range, Florida* (USAF 2001) and the *Final Environmental Assessment for Expanding the North Military Operations in Urban Terrain (MOUT) Target Array at Avon Park Air Force Range, Florida*, (USAF 2005) have broad location maps of the MOUTS and physical site descriptions that will assist in interpreting the following described proposed action and alternatives (DOPPA).

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

There is a Proposed Action, an Alternative Action, and a No-Action alternative. For the North MOUT, the Proposed Action would disk to mineral soil the entire site where the new buildings and roads would be placed per expansion effort. An expansion plan for 2008 is described as follows. Roads would be established between the buildings to allow vehicles multiple travel routes. The vegetation would be mowed once or twice annually. The South MOUT would be disked once or twice annually. The Alternative Action would develop the buildings and roads as the Proposed Action would, but would seed a pasture grass on the portions of disked expansion sites not occupied with buildings or roads in the North MOUT. The South MOUT would be disked. The No-Action alternative would fall back to the construction and expansion concept as described in the construction and expansion EAs. It would limit site work and training as described in the EAs. There would be no disking in the South MOUT. All alternatives, including the No-Action alternative, would continue to employ the North and South MOUTs for military training. The construction EA already considered a no training alternative of which the Proposed Action - a training action, was selected. Therefore, in this EA the No-Action alternative falls back to the Proposed Actions of the construction and expansion EAs.

Fourteen percent (about four acres) of the North MOUT is currently developed; of which four percent is contributed by existing roads that form a four way intersection (see Appendix A for calculations). The road coming in from the south is an improved road with a clay/shell base, while the other roads are unimproved, two-track roads.

2.1 Proposed Action

The Proposed Action would consider the immediate expansion/upgrades for 2008 and projected growth over the next 20 years.

North MOUT: The 2008 upgrade would disk to mineral soil 0.90 acres and establish up to 16 concrete buildings southeast of the four-way intersection (see Figure 2.1-1). The buildings would consist of large concrete blocks and be no larger than ten meters long by ten meters wide by three meters high and constructed in the manner described in the expansion MOUT EA. Some of the buildings would be connected to each other by concrete highway traffic barricades simulating walls. Two side streets would be established by lying down and compacting shell/clay material obtained from off the installation. The streets would be compacted above ground level to prevent stormwater runoff from eroding the streets. The streets would be a total of 365 meters long by five meters wide. 195 linear meters of the streets would be within the 0.90 acres of building construction site, while 170 meters would be south of the building construction site. The buildings would be built first, then the streets. Construction is anticipated in 2008, but could be delayed to subsequent years.

To facilitate stormwater runoff, street swales, four culverts, and a detention pond would be constructed for the 2008 upgrade. The swales would be about 30 centimeters in depth, two meters wide, and each approximately 570 meters long and dug on both sides of the proposed streets as well as along the east side of the main road coming into the North



Legend

- New Roads
- ▨ Building Site
- North MOUT Boundary

0 170 340 680 1,020 1,360 Feet

Figure 2.1-1 The North MOUT with proposed new building location and roads.

MOUT from the south (Figure 2.1-2). These swales would drain water north via a culvert under the east road leading into the North MOUT coming from the east. Upon reaching this road, water would be diverted by another swale running east for



Figure 2.1-2 The North MOU with the proposed stormwater runoff system, water flow shown in red arrows.

approximately 150 meters. Water would then travel north through a swale until reaching a detention pond. The pond would be 68 meters by 68 meters (one acre) with a depth of

50 centimeters with a flat bottom. To reduce the refraction of laser equipment, the pond would be lined with a non-woven, permeable fabric with the fabric being covered with broken tile, rock, or brick (3 to 15 centimeters in diameter) for a depth of 30 centimeters. For the outflow, the pond would have a metal weir with a water energy spreading swale of approximately 15 meters long and consisting of crushed concrete, tile, brick, or rock. The detention pond's dimensions were determined for three acres of stormwater runoff to include the water displaced by tile, rock, or brick. Fill from the detention pond would be used to build up the new roads and culverts. The pond would be at ground level with no berms. The pond would have an overflow metal weir with an energy swale approximately 16 meters long and consisting of crushed concrete. A silt fence around the construction site would function as the best management practice to control stormwater runoff during construction. The silt fence would be removed after construction, whereupon the area would revegetate naturally.

Two existing metal buildings in the proposed construction area consisting of conex boxes would be moved northeast of the road intersection. The vegetation where the buildings would be placed would be removed to bare mineral soil only to the extent of the size of the buildings.

Ultimately, the North MOUT could be fully developed within 20 years for a total of 26 acres. So far, there have been two expansions in six years. The type of development is expected to consist of the metal and concrete buildings as described in the construction and expansion EAs. It is known that each expansion would probably be less than one acre per year. In general, an average new building would occupy 870 square feet and have an offset of about 1,800 square feet for a total area of development being 2,670 square feet. Of the 1,800 square feet offset, an average of 560 square feet would consist of an improved clay/shell road. Swales would be developed along the new roads. If the North MOUT were fully developed, three acres of detention ponds would be developed. Several ponds would be constructed as the North MOUT would grow. These ponds would be located within the North MOUT boundary or just outside of the boundary.

Maintenance would require mowing a five meter buffer around each building twice a year and road maintenance twice a year. Both would occur at least once during the summer. Ordnance disposal would consist of picking up spent, inert ordnance within the North MOUT and would be conducted periodically – typically in January or February, but could occur any time of year. Building replacement would occur once a year, especially the metal buildings that served as targets. The remaining non-target buildings have traditionally been hit in the past by ordnance as collateral damage and would need to be replaced. Typically, three buildings would require replacement annually. One or two buildings are typically moved to new locations during expansions. Building replacement and moving typically would occur in January and February, but could occur any time of year. Craters are formed by heavier ordnance. They would be mechanically filled annually after the ordnance is retrieved.

South MOUT: The South MOUT would be disked in its entirety (eight acres) one or two times annually (see Figure 2.1-3) to reduce vegetation and fill bomb craters. One diskings



Figure 2.1-3. The Proposed disked area shown in red for the South MOUT.

would likely be scheduled for January and February, but could occur any time of the year. No shell/clay would be added to the roads.

North and South MOUT: Training and ordnance deliveries would remain the same as described in the construction and expansion EAs. In addition, the North MOUT would have wheeled vehicles, including those used in close combat, which would travel on the new road network. Mortars firing from the North and South MOUTs were added in 2006 by another EA (USAF 2006). Briefly, mortars can fire high explosives from the MOUTs into distant high explosive ranges.

The amount of inert ordnance delivered directly in the North and South MOUTs on an annual basis is not known. The amount of inert ordnance delivered annually in the ranges where the North and South MOUT are located is known and summarized in Table 2.1-1. Not shown in the table are inert ordnance deliveries from 155mm and 105 howitzers. While the construction EA described and assessed all inert ordnance deliveries, inert ordnance from howitzers has not been commonly used in inert target ranges where the

North and South MOUTs are located. In October 2007 up to 750, 155mm howitzer inert ordnance deliveries were made on the South Tactical Range where the South MOUT is located and 750 inert ordnance deliveries in the North Tactical Range where the North MOUT is located. About a dozen craters resulted within the South MOUT perimeter, none in the North MOUT. This type of training with howitzers could occur twice annually in both the North and South MOUTs.

Table 2.1-1. The Amount of Ordnance Expended Annually as a Baseline in the North and South Tactical Ranges at Avon Park Air Force Range.

Ordnance	Number
5.56mm bullet	17,200
7.62mm bullet	196,072
.50 Cal bullet	64,000
20mm bullet	19,295
25mm bullet	2736
30mm bullet	58,242
RRPR	600
BDU & Mk	8,894
2.75 in rocket (inert)	3,230

*modified from **Table 2.2.4-2** in the *Final Environmental Assessment for Semi Annual Joint Integrated Fires Exercises at Avon Park Air Force Range, Florida, April 2006*.

The impact ranges at APAFR were utilized for training an average of 27% of their capacity during the years of 1997 through 2003 (USN 2005). An increase to 30% was determined for 2005 onward (USAF 2006).

2.2 Alternative Action

The Alternative Action would expand, upgrade, and provide training as described in the Proposed Action. In addition, post construction, the offset areas between the buildings and the roads in the North MOUT that were disked would be seeded with bahia grass. This is a common pasture and turf grass that does not easily spread beyond the location of where it is seeded. The objective of establishing bahia grass would be soil stabilization and to minimize the risk of invasive, exotic weeds establishing in the North MOUT. This would be accomplished by bahia sod being formed where it would be seeded. The bahia would be either drill seeded or broadcast seeded. Drill seeding would not require seedbed preparation nor mulching. Broadcast seeding would require mechanical compaction of the seedbed with a roller. Compaction would occur after seeding and then a mulch (typically straw) applied. Both seeding methods would require increasing the soil pH by adding lime at a rate of 3,000 pounds per acre and increase nitrogen in the soil by adding 200 pounds per acre of active nitrogen by commercial fertilizer for initial plant establishment. For maintenance, the bahia grass would be mowed once a year during the summer and limed annually at 3,000 pounds per acre. Commercial fertilizer would not be applied for maintenance. It is anticipated that cattle would graze the north MOUT in rotation and therefore assist in keeping the bahia grass low in stature and add fertilizer

through urine and manure.

2.3 No-Action Alternative

The No-Action alternative would default to the construction and expansion EAs. The building site preparation would limit ground surface disturbance to the physical perimeter of the new buildings and no new roads would be established. Vehicle travel would be restricted to the existing roads. Foot traffic would not be controlled. No mowing would be performed around the buildings. The South MOUT would not be disked.

2.4 Required Permits and Coordination

A Generic Permit for Stormwater Discharge from Large and Small Construction Activities must be obtained from the Florida Department of Environmental Protection (FDEP) if construction activities under the Proposed and Alternative Actions would exceed one acre issued under the provisions of Florida Statutes, Section 403.0885. This provision authorizes the State of Florida to implement the National Pollution Discharge Elimination System as regulated in 40 CFR Part 122.26 under Section 402(p)(2) of the Clean Water Act.

APA FR initiated consultation with the United States Fish and Wildlife Service (USFWS) for the eastern indigo snake, the Florida scrub-jay (FSJ), and the red cockaded woodpecker (RCW) for the North MOUT and for the Florida grasshopper sparrow (FGS) and eastern indigo snake in the South MOUT as per Section 7 of the Endangered Species Act for the Proposed and Alternative Actions - see Section 8 *Record of Correspondence* in this EA. The USFWS responded with APA FR's concurrence of no affect for the RCW and the FSJ, and may effect, not likely to adversely affect the eastern indigo snake and the FGS.

APA FR initiated consultation with the Miccosukee Tribe of Indians of Florida and the Seminole Nation of Oklahoma. Both the Miccosukee Tribe and the Seminole Nation concurred with no effects to cultural resources, although the Seminole Nation requested immediate consultation if human remains, funerary objects, or associate objects are discovered during construction and maintenance activities – see Section 8 *Record of Correspondence* in this EA and Section 9 *Record of Responses to Comments*.

APA FR initiated consultation with the Florida State Historic Preservation Officer (SHPO) with a determination of no effect on any historic properties eligible for listing in the National Registration of Historic Places. The SHPO concurred – see Section 8 *Record of Consultation* of this EA.

APA FR supplied draft copies of the EA to local county and city governments for their review and comment. A negative reply from the Polk County, Florida Land Development Division was the only response.

APA FR supplied the Florida State Clearinghouse with draft copies of the EA for distribution to state regulating agencies. The Florida Fish and Wildlife Conservation Commission requested that information be added for the Florida grasshopper sparrow and

management precautions for the gopher tortoise and eastern indigo snake be taken. The comments were summarized and addressed in Section 9 *Record of Responses to Comments*, while the letter of response from the FFWCC is in Section 8.

APAFR ran one local newspaper advertisement announcing public review of the draft EA available at one public library in Polk County and one public library in Highlands County. No comments from the public were received.

2.5 Acts and Executive Orders Not Applicable to the Project

The following acts and executive orders are not addressed in this document because they are not applicable to the Proposed Action and alternatives. Justification for not addressing each act or executive order is described. Marine Mammal Protection Act as amended through 2001 and Magnuson-Stevens Act as amended through 1996 – APAFR is located in the interior of peninsular Florida and does not encompass mammals associated with marine environments. The Magnuson-Stevens Act protects salt water and anadromous fish populations. Water bodies associated with APAFR are fresh water and do not support salt water or anadromous fish populations, including the navigational Kissimmee River. The Kissimmee River is part of the Lake Okeechobee/Everglades watershed.

Executive Order 11988 Floodplain Management – the project locations do not occur in floodplains.

Executive Order 13045 Protection of Children From Environmental Health Risks and Safety Risks and Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations – the project area is located in an ordnance and gunnery impact range that was originally and intentionally located away from human populations. The project itself would not come into contact with any human populations. Noise generated from aircraft using the range and associated airspace has the potential to affect children, minorities, and low income populations (USN 2005), however, the Proposed Action and alternatives would not directly or indirectly change the location, altitudes, numbers, or frequency of noise producing aircraft using the range.

3.0 AFFECTED ENVIRONMENT

3.1 Airspace and Aircraft Operations

Airspace management includes the handling, directing and controlling of flight operations in the air. The airspace region of influence (ROI) encompasses an area within a 30 nautical mile radius of APAFR from the ground surface up to 18,000 ft above mean sea-level. This represents a three-dimensional volume of airspace that supports air-to-ground conventional and tactical weapons delivery training, tactical navigation training, advanced air-to-air combat training, and equipment and personnel airdrop operations.

3.2 Safety

Safety is a measure of the potential for individuals or equipment to experience a mishap. Mishaps are measured in four levels, Classes A through D. For an individual, mishaps range from a minimum of a worker sustaining an injury that does not result in a loss of worker productivity (Class D) to a loss of life (Class A). For equipment, a minimum is equipment experiencing \$2,000 to \$10,000 of damage (Class D) to over a million dollars in damage (Class A). There has been one Class C personnel injury (an injury causing a loss of work, but not resulting in a permanent, debilitating injury) in the North MOUT related to the use of an ATV. This mishap occurred in 2006.

Operational risk management (ORM) as defined in Air Force Instruction 90-901 (USAF 2000) is “A decision-making process to systematically evaluate possible courses of action, identify risks and benefits, and determine the best course of action in any given situation.” It is applied in all levels of the Air Force when conducting activities. It is essential in military combat training. ORM is a six step process that identifies the hazards, assesses the risk, considers risk control measures, makes control decisions, implements risk controls as you carry out the activities, and supervises and reviews. ORM ranges from a simple mental exercise such as carrying out a simple task in an environment with low risks to safety to rather elaborate models for conducting complex, integrated tasks in higher risk environments. Generally, the greater the perceived potential for a mishap to occur the more effort will go into ORM. Both the North and South MOUTs were created and later the North MOUT expanded to afford complex combat training scenarios that inherently carry risk and high ORM effort by those personnel training. Each level of training conducts its own respective ORM methodology and assessment, hence ORM results will vary by exercise. The question is, is there some baseline ORM measure of the North and South MOUTs as they currently exist? While not optimally capturing each level of training, APAFR has its own ORM matrix that is employed for the staff’s work activities on the installation and is used in this EA as an example to measure the safety of the North and South MOUTs.

The APAFR matrix combines Hazard Severity (HS), Risk Potential (RP), and Exposure (E) to determine a Danger Index (DI), see Appendix B (Creative Work Designs 2002). Hazard Severity considers the capability of an environment to cause harm and the ensuing level of severity, Risk Potential - the opportunity to cause harm factored in with those measures employed to reduce risk, and Exposure – the degree to which people and property are exposed to hazard and risk. The resulting Danger Index ranges from a score

of 0 to 100. The scale is broken into one quarter increments, low (0-24) being Low Priority and High (75-100) Immediate Action.

The following two examples give some understanding of the operational risks of the North and South MOUTs. The first example is a two person aircrew delivering ordnance on targets in the North and South MOUT from one aircraft. The second example is a platoon (30 personnel) of Marines and four Air Force TACPs training in the North MOUT. In the second example, the Marines and TACPs are in a convoy and have just been disabled by a mock IED and are taking mock small arms fire from pop-up targets. Ultimately they want to establish a defensible position; return small arms fire (fire live ammunition) and deliver ordnance (dry fire) from an A-10 aircraft within fifteen minutes travel time to the North MOUT.

For the first example, the Danger Index score is as follows: HS=1, RP=0.05, E=Level 1 with a resulting DI= 0.313 (Low Priority) for both the North and South MOUT. The Hazard Severity is low because the aircrew is not in contact with the MOUT, although it is possible for the aircrew to hit a non-target building with ordnance that would incur a minor cost to repair – a Class D mishap. The Risk Potential is rated the lowest at 0.05 because the crew is only dropping two dummy bombs at targets in the MOUTs. The Exposure is the lowest, Level 1, because they are only spending 20 minutes on the range and just seconds of time over the North MOUT.

The second example scores as follows: HS= 4, RP=0.05, E=Level 4 with a resulting DI= 5 (Low Priority). Due to small arms live fire, the Hazard Severity could result in death or serious injury and therefore ranks the highest score. The Risk Potential is low because measures are in place that reduces risk. These measures include the personnel being weapon qualified, are trained in small arms combat, and wear helmets and body armor. The Exposure is Level 4, the highest score, because the Hazard Score is high.

The both examples are fairly typical of training in the MOUTs.

3.3 Water Resources

Groundwater/Watersheds

APAFR lies on top of the Florida surficial aquifer (see Figure 3.3-1). The surficial aquifer is unconfined with sand and shelly sand material. Thickness is often less than 15 meters. Groundwater from rainfall recharges the aquifer. The aquifer then discharges in creeks and rivers as base flow or recharges deeper aquifers.

APAFR lies in the Kissimmee watershed hydraulic unit code (HUC 3090101) as determined by the United States Geological Survey (USGS 2007). This watershed is further divided into subset watersheds (WBIDs). The North MOUT occupies the Morgan Hole Creek (WBID #1761-D) subset watershed to the west and the Eight-Mile Slough (WBID #3187-A) subset watershed to the east (Figure 3.3-2). For the Morgan Hole Creek subset watershed, surface water flows as overland flow into Morgan Hole Creek, from Morgan Hole Creek to Arbuckle Creek, to Lake Istokpoga, then Lake Okeechobee and the Everglades. For the Eight-Mile Slough subset watershed, surface water flows to

Avon Park Air Force Range in relation to Florida Groundwater Aquifers

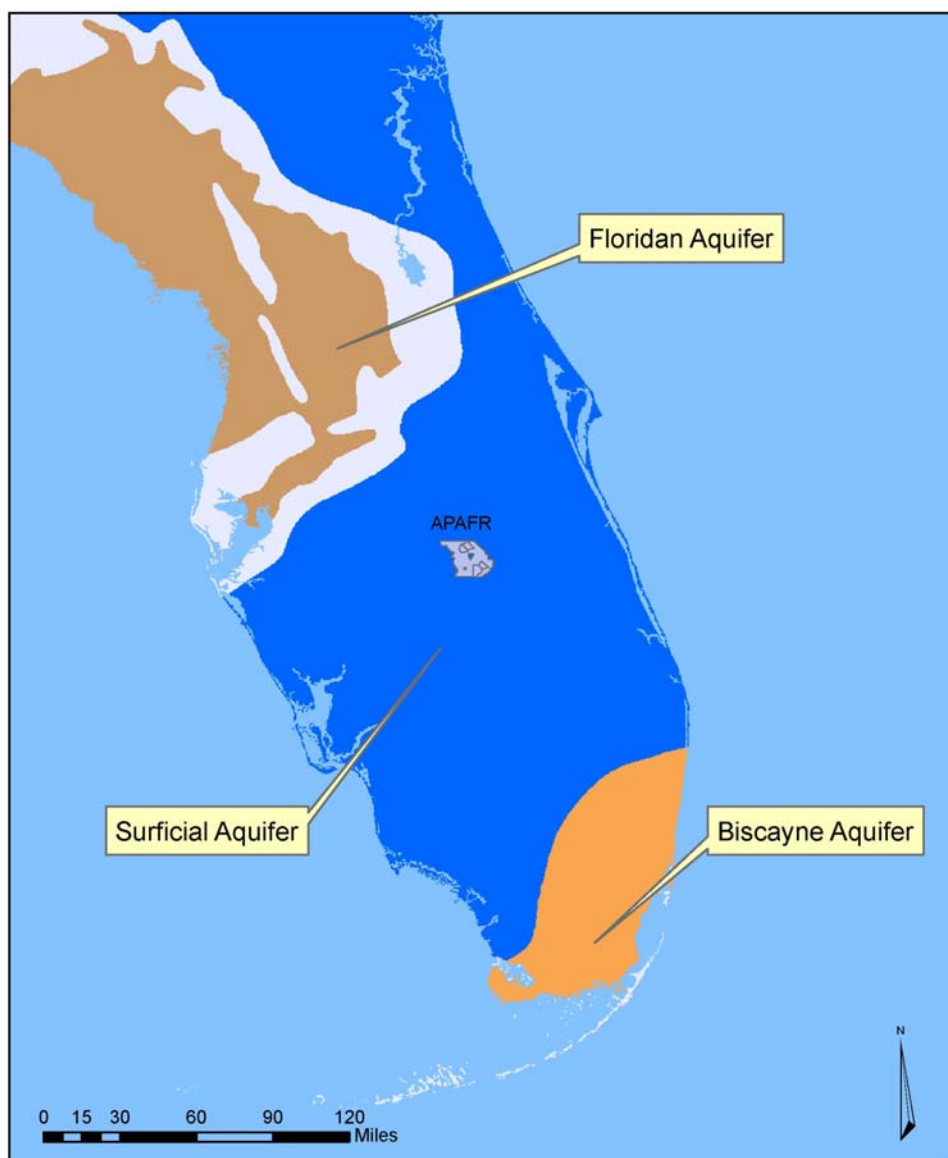


Figure 3.3-1. Avon Park Air Force Range occupies the surficial aquifer.

N MOUT AREA in relation to WETLANDS, WBID, WATER BODIES

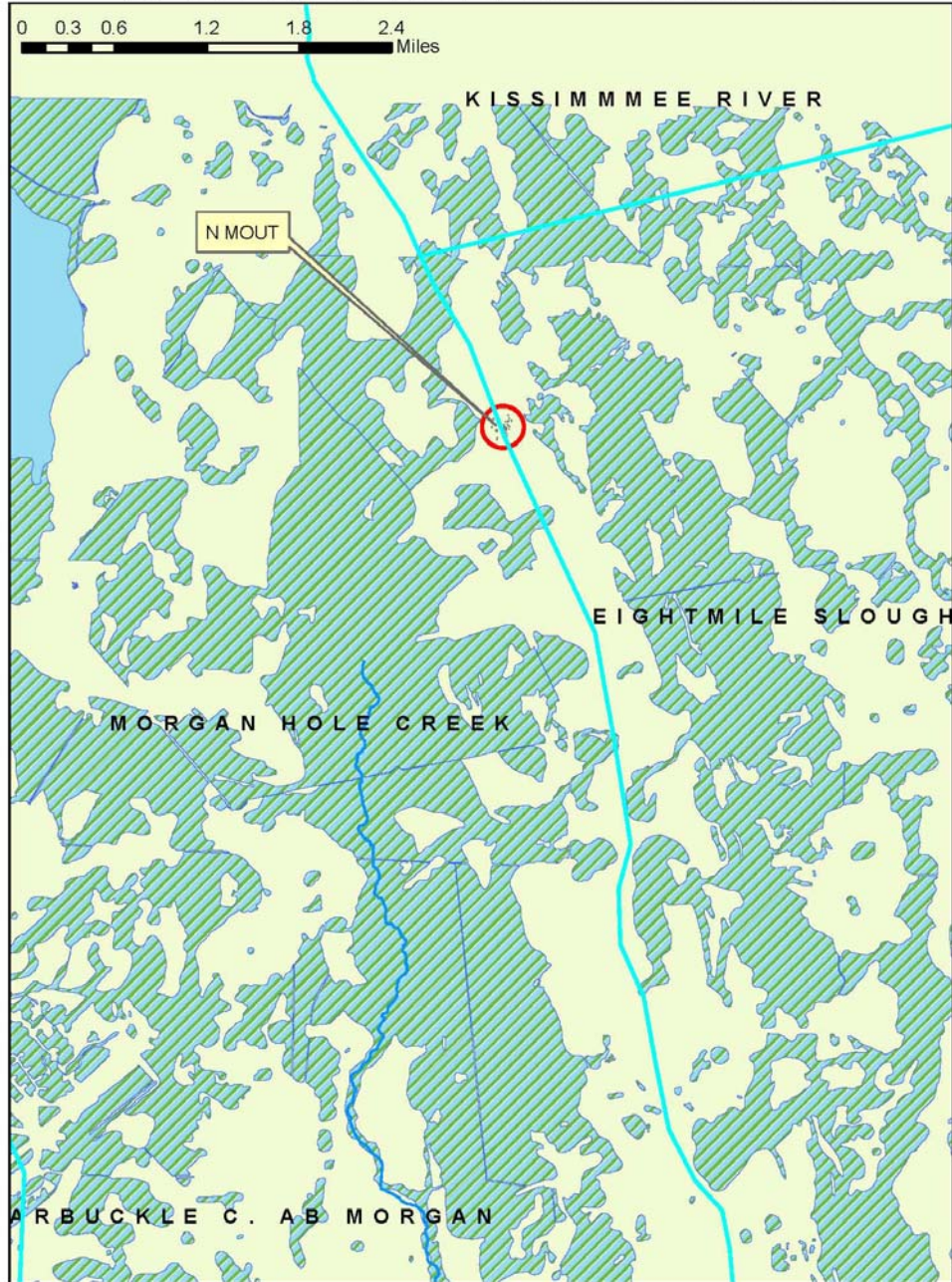


Figure 3.3-2. The North MOUT location in relation to subset watersheds and wetlands.

the intermittent Eight-Mile Slough, then into the Kissimmee River, then Lake Okeechobee and the Everglades. The North MOUT straddles a sand ridge with surface water running off the North MOUT in north, east, and west directions. Water does not flow south of the MOUT because the ridge is slightly higher south of the MOUT. The South MOUT is located in the Kissimmee River subset watershed (WBID #3187-A). Surface water follows into Hick's Slough, then the Kissimmee River, then into Lake Okeechobee and the Everglades.

A soil erosion survey of the impact ranges was conducted in 2007. The survey determined that only the North Tactical Range experiences excessive erosion (Appendix C). The west portion of North MOUT drains into a portion of the area determined to experience excessive erosion. Therefore, the erosion area below and west of the North MOUT was investigated further. The drainage area was determined to be 157 acres in size of which 13.4 acres were considered developed (disklines, roads, MOUT) (Figure 3.3-3). The currently developed North MOUT was determined to contribute 1.8 acres of the developed 13.4 acres – not all of the North MOUT is in the drainage area - the MOUT area drains north and east as well. Using the Florida Department of Environmental Protection's (FDEP) runoff calculation for stormwater runoff (FDEP 2007), 51.68 acre feet of stormwater below and west of the North MOUT was calculated to run off the erosion area into a swamp that serves as a headwater for Morgan Hole Creek.

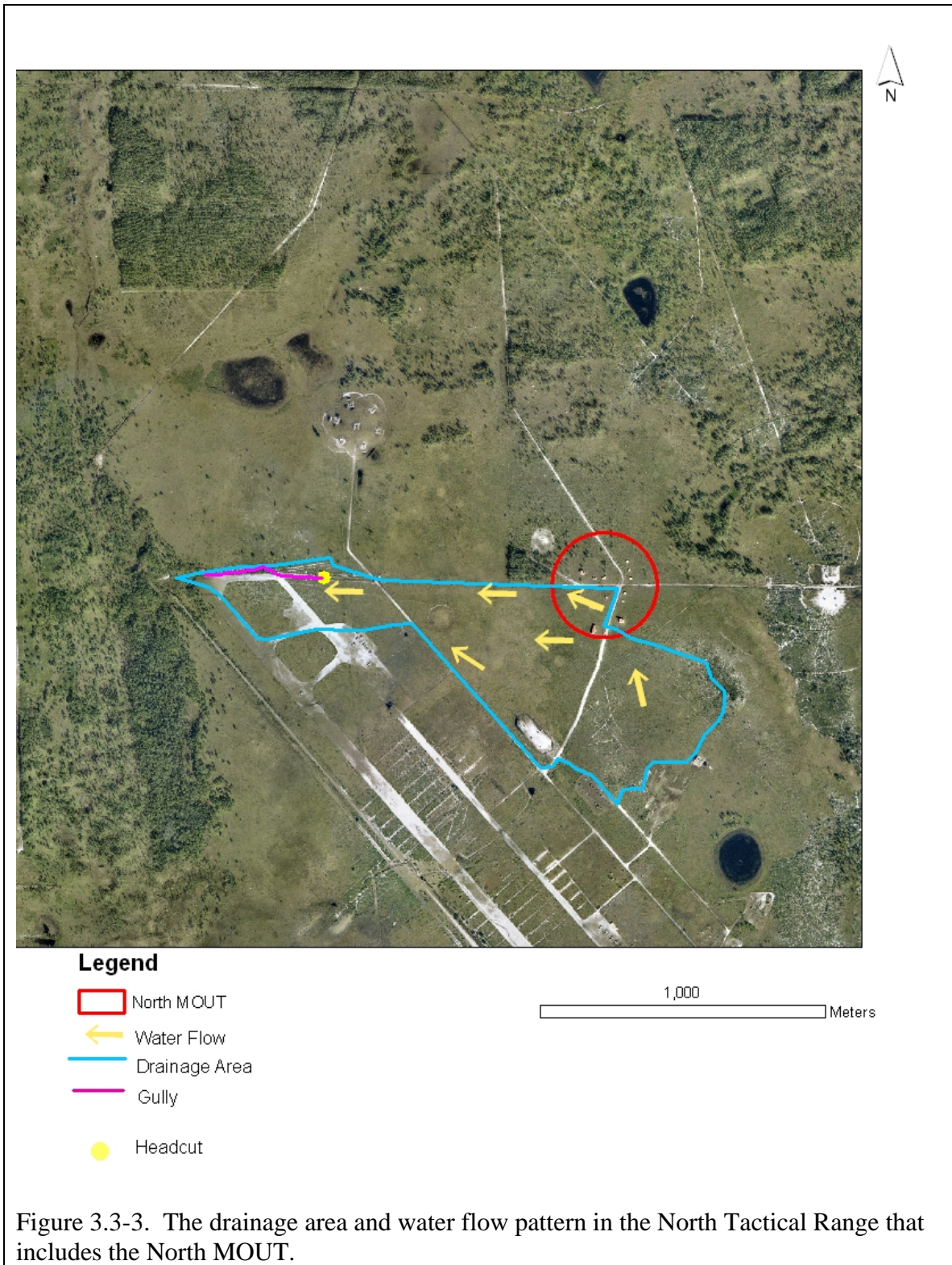
Nearly all of the runoff is channeled through a gully located about 1,000 meters due west and down slope of the North MOUT. The gully originates with a head cut that is one meter deep and penetrates the water table. Water seeps from the head cut (no measurable flow when inspected) and remains as surface water in the gully floor until reaching a pine swamp about 450 meters down slope. These observations were made in November 2007. While this gully exhibits accelerated water flow it is important to note that below the gully, Morgan Hole Creek exhibits stable banks and a functioning floodplain within and exiting the North Tactical Range; this indicates that the headwaters swamp is able to dissipate the gully's accelerated water flow sufficiently to maintain a functioning creek. This is further evidenced by a depositional fan below the gully that is well vegetated. The gully does appear to have dropped the water table immediately adjacent to gully as indicated by the establishment of about 100 pine trees with basal diameters of one to 30 centimeters. These trees appear to have been cut two to four years ago and felled in a manner to slow water flow in the gully.

Wetlands

Although APAFR's wetlands comprise more than 50% of its land area, no jurisdictional wetlands are encompassed in the North MOUT and South MOUT.

Water Quality

For APAFR, water bodies/streams in the Morgan Hole Creek subset watershed exceeds the maximum fecal coliform level as set by the FDEP. The state maximum fecal



coliform level is 800 “most probable number” of colony forming units per 100ml of water (800 MPN/100ml). The measured fecal coliform level in the Morgan Hole Creek subset watershed is 955 MPN/100ml (USAF 2005a). The water bodies/streams in the Kissimmee River subset watershed also exceed the state standard for total fecal coliform, but the FDEP has determined these high counts of fecal coliform to be a natural condition and that an implementation plan by APAFR to reduce this pollutant found in waters within APAFR’s boundaries is not required.

3.4 Geology and Soils

The earth resources which would be potentially impacted include surficial geologic resources, soils, and to some extent subsurface deposits. Two areas of MOUT upgrades would be affected: the North MOUT (in the North Tactical Range) and the South MOUT (in the South Tactical Range).

The North MOUT within the North Tactical Range is located on the Bombing Range Ridge. This ridge is a remnant of a marine sand bar that rises from 40 to 66 feet (12 to 20 meters) above the base level of the surrounding Osceola Plain. It is located four to seven miles (six to 12 kilometers) east of the eastern boundary of the Lake Wales Ridge and is separated from it by the Arbuckle Creek valley. The Bombing Range Ridge, oriented north to south and occurring at approximately center of the installation, is located primarily within APAFR. In contrast, the South MOUT within the South Tactical Range is located on the nearly-level, flatlands of the Osceola Plain of the Atlantic Coastal Lowlands physiographic province.

The surficial geology at APAFR consists of undifferentiated deposits of unconsolidated sands, shell, and silt of Pliocene-Pleistocene age. These deposits range in thickness from 50 to 150 feet (15 to 45 meters) and are deepest under the Bombing Range Ridge and consist of various Miocene to Eocene-aged limestone formations cemented by carbonates. They are primarily the Peace River Formation and the Hawthorne Group. The Peace River Formation consists of interbedded sands, clays, and dolomite with variable phosphate content. The Hawthorne Group, a member of the Arcadia Formation, consists of quartz, sandy, phosphatic, and sometimes clayey dolomites and limestones. Below the Hawthorne Group lie the Ocala Group and Avon Park Limestones. The Ocala Group contains two upper formations, both of which consist of a coquina of large foraminifera in a chalky calcilutite matrix, and a lower formation of limestone and dolomite. In southeast Polk County, the top of the Ocala Group is approximately 100 feet (30.3 meters) below mean sea level and generally about 300 feet (91 meters) thick. The Avon Park Formation lies below the Ocala Group and consists of finely crystalline dolomite with some fossiliferous limestone. It is a highly fractured, very permeable, and up to 700 feet (212 meters) thick.

Both of the MOUT sites soils are spodosols. These soils are characterized by a subsurface zone called a spodic (organic) horizon layer and are poorly drained sands. The North MOUT site is on Myakka soil series. The soils of Myakka are classified as sandy, siliceous, hyperthermic, aeric, haplaquads (Carter 1995). Myakka soils are deep to very deep sandy soils, that are poorly to very poorly drained, with rapid permeability

in the A horizon and moderate to moderate rapid permeability in the Bh horizon (Carter 1995). Myakka soils have a sand or fine sand texture in the upper horizons and are extremely to slightly acidic (Carter 1995). In contrast the South MOUT site occurs on the Basinger soil series. Basinger soils are classified as siliceous, hyperthermic, spodic psammaquents (Carter 1995). Basinger soils are poorly to very poorly drained, with rapid permeability, with a water table at depths of less than 12 inches (30cm) for 2 to 6 months annually and at depths of 12 to 30 inches (30 to 75 cm) usually for periods of more than 6 months in most years (Carter 1995). Basinger soils are fine sands and acidic in the upper soil horizon (Carter 1995). Both the Basinger and Myakka soils are erodable when the natural vegetation is removed by disking. The upper epipedons (soil horizons) are lost or altered thereby reducing the soil fertility. Basinger soils are severely limited to establish buildings and roads because slopes are so gentle and ponding prevalent that establishing drainage systems is usually not possible. Buildings and roads can be established by elevating them. Myakka soils are also severely limited for buildings and roads due to wetness, but have more potential than Basinger soils. Myakka soils do not pond and therefore allow for drainage systems as well as elevated roads and buildings (SCS 1990).

A soil erosion survey of the impact ranges was conducted in 2007 resulting in excessive soil erosion being noted in the North Tactical Range (Appendix C). Specifically, soil erosion on the west facing slope of the North Tactical Range draining into Morgan Hole Creek is an acknowledged concern and has hindered range activities in the past by creating road washouts and washing out portions of mock airfields. Because of this history of erosion, particular emphasis was made to determine what area lies down slope of the North MOUT and within the North Tactical Range where soil is known to be eroding. The North MOUT is on top of a sand ridge with water draining to the north, east and west. Approximately eight acres of the southwest portion of the North MOUT drains near the top of a 157 acre drainage area that encompasses the erosion area. General field observations in November 2007 and January 2008 indicated minimal sheet erosion on the vegetated landscape due to an absence of minor rills and plant pedestaling. Erosion was evident, however, where roads and disk lines with respective ditches and berms intercepted sheet water flow and channeled water in concentrated areas. Soil erosion is therefore predominately from sediment being removed and transported from roads, disklines, ditches, and berms that transport intercepted surface water flow. Specifically, a past disk line used as a road due west of the North MOUT has intercepted water and accelerated erosion so that a head cut has formed below the water table. Below the active head cut, water has continued to down cut and laterally cut the soil profile so that a gully has resulted. This gully has transported large amounts of Myakka sands down slope where it has deposited a sandy delta in Bravo Range over hydric muck soils. The gully is approximately 1,350 feet (450 meters) in length, 24-30 feet (eight to ten meters) wide, and three to nine feet (one to three meters) deep.

3.5 Vegetation

No federally listed threatened and endangered plants are known to occur at either of the MOUT sites.

The North MOUT is within a frequently burned example of what would be classified as a dry-mesic, sandy pine flatwoods. It encompasses 26 acres of dry-mesic flatwoods. The pine flatwoods at the North MOUT has very widely scattered (essentially tree-less condition), pine trees (*Pinus elliottii* var. *densa*), with wiregrass (*Aristida beyrichiana*), saw palmetto (*Serenoa repens*), and the low-growing oak (*Quercus minima*) being dominant in the ground cover. Other dominant species in the dry-mesic communities include splitbeard bluestem (*Andropogon ternarius* var. *cabanisii*), an abundance of shrubs such as St. John Wart (*Hypericum reductum*), staggerbush (*Lyonia fruticosa*), and fetterbush (*Lyonia lucida*). The dry-mesic pine flatwoods community type has some plant species not common within other pine flatwood types at APAFR including finger-rot (*Cnidoscolus stimulosus*), *Chapmannia floridana*, coastalplain chaffhead (*Carphephorus corymbosus*), and lesser Florida spurge (*Euphorbia polyphylla*). Other characteristic species include dwarf huckleberry (*Gaylussacia dumosa*), rough hedgehyssop (*Gratiola hispida*), Chapman's skeletongrass (*Gymnopogon chapmanianus*), gopher apple (*Licania michauxii*), short-leaf gayfeather (*Liatris tenuifolia* var. *quadriflora*), southern waxmyrtle (*Myrica cerifera*), narrow leaf silkgrass, *Pityopsis graminifolia*., dense-spike blackroot (*Pterocaulon pycnostachyum*), coastal plain milkwort (*Polygala setacea*), sensitive briar (*Mimosa quadrivalvis* var. *floridana*), few flower nutrush (*Scleria pauciflora*), lopsided Indiangrass (*Sorghastrum secundum*), and Carolina yellow-eyed grass (*Xyris caroliniana*).

The South MOUT site is within the Florida dry prairie landscape and would affect approximately 7.7 acres of Florida dry prairie, specifically in wet-mesic, spodic prairie, that has been subjected to frequent fire at least since establishment of the range in the early 1940's. Despite numerous bomb craters and recent disturbances from discing the ground cover vegetation still has some native vegetation that consists of plants characteristic of wet-mesic prairie.

Common plant species at the South MOUT include a diversity of bluestem (*Andropogon*) species, with wiregrass (*Aristida beyrichiana*) being dominant. Species occurring much more frequently within this community type that serve to distinguish it from other dry prairie community types include shortspike bluestem (*Andropogon brachystachyus*), broomsedge bluestem (*Andropogon virginicus* var. *decipiens*), creeping bluestem (*Schizachyrium stoloniferum*), road grass (*Eleocharis baldwinii*), short-leaved yellow-eyed grass (*Xyris brevifolia*), inkberry (*Ilex glabra*), southern waxmyrtle (*Myrica cerifera*), narrow-leaved silkgrass (*Pityopsis graminifolia*), and shinny blueberry (*Vaccinium myrsinites*). Other plants at the site include toothache grass (*Ctenium aromaticum*), woolly sunbonnets (*Chaptalia tomentosa*), pineland chaffhead (*Carphephorus carnosus*), and morning yellow-eyed grass (*Xyris ambigua*).

Avon Park Air Force Range historically had approximately 24,242 acres (9,697 ha) of Florida dry prairie landscape scattered in four geographic regions on the base. Currently it is estimated that approximately 9,192 acres (3,677 ha) remains at APAFR. At APAFR the southern quadrat historically had the largest extent (13,625 acres or 5,450 ha) of prairie landscape (Bridges 1999). The southeast quadrat once accounted for nearly 38% of the prairie landscape at APAFR and includes parts of South Tactical Range where the

South MOUT site is located.

3.6 Invasive Plant Species

North MOUT: There currently are no active colonies of invasive plants in the North MOUT. There is potential for invasive species to spread to the North MOUT. Two federally listed noxious weeds, tropical soda apple (TSA) and cogon grass, are both candidates for potential invasion into the North MOUT due to existing proximity and/or site potential. Specifically by proximity, TSA and cogon grass occupies the North Tactical Range and are approximately 600 meters and 1,500 meters, respectively, from the North MOUT. TSA occupies approximately one acre while cogon grass occupies 150 acres straddling both the North Tactical and Conventional Ranges. Tropical soda apple is spread by the fruit being ingested by livestock and wildlife with seeds being dispersed from their feces. Cogon grass is dispersed by airborne seed or spreading rhizomes. Seed can be dispersed by wind as far as 110 meters from the parent plant (USFS 2007). Cogon grass in the North Tactical Range is on a road network that connects to the MOUT and could result in cogon grass seed spreading to the MOUT by vehicles transporting the seed. Both plants establish well in disturbed soils, soils within the pine flatwoods, and in full sun. The North MOUT is in the pine flatwoods (SCS 1990), has disturbed soils, and is in full sun. Cogon grass is stimulated by fire in terms of regrowth and higher seed viability. The North MOUT typically burns annually.

South MOUT: There currently are no active colonies of invasive plants in the South MOUT. Cogon grass occurs in the South Tactical Range, but is over 2,750 meters away, occurs in four locations being cumulatively less than one acre, and not on a road network connected to the South MOUT. Cogon grass is well established in the South Conventional Range to the north along the main road that accesses the South MOUT and could result in cogon grass establishing in the South MOUT by vehicles transporting seed. This infestation is 2,700 meters away. The South MOUT is on the Slough range site (SCS 1989). This range site has wet soils and does not offer as conducive of a site for the establishment of cogon grass, although there is potential. The South MOUT site is in full sun and due to disking, is disturbed. The South MOUT has low potential for burning due to a lack of vegetation in response to disking.

APAFR has an invasive weed management program which consists of surveillance, treatment, and monitoring. Chemical herbicide is the most common treatment since there are no known effective biological controls of the known invasive plant species present.

3.7 Fire Management

The North MOUT occupies portions of Foxtrot Fire Management Unit (FMU) 7 (68 acres), FMU 4 (351 acres), and FMU 6 (1,899 acres) – all in Grazing Pasture 6C. The road network creates an intersection in the North MOUT that acts as a fuel break and results in the MOUT occupying portions of these FMUs. The FMUs last burned in 2007 and generally burn annually to every 18 months. The vegetation in the North MOUT does burn within 12 to 18 months as well, but typically not during the burning prescription made for the respective FMUs because the current target management and training operations cause disturbance that reduces fuels for prescribed fire as well as fuel

reduction by disproportionate cattle grazing-use/loafing brought on by disturbance and shade from the buildings. Therefore, burns in the North MOUT are typically wildfire ignited by ordnance deliveries or gunnery and burn with low intensive and are patchy.

The South MOUT occupies the Echo FMU 2 (5,367 acres) in Pasture 3D. The South MOUT burns similarly as the North MOUT until recently when disked. Surrounding areas within FMU 2 last burned in 2007 and generally burned annually to 18 months.

The fuel types for fire are Fuel Model 1 (light grass) for FMUs occupied by the North MOUT, and Fuel Model 3 (tall grass) for the FMU occupied by the South MOUT (Anderson 1982). Bare sand is found in all FMUs in both the North and South MOUTs. The fire effects objectives for all FMUs are to minimize the risk of ordnance ignited fires and to maximize ecological productivity. While the MOUTs burn as wildfires due to ordnance deliveries and gunnery practice, the wildfires are minimized in size and intensity because the adjacent FMUs have reduced fire fuel loads from prescribed burns so that wildfire spread is minimized.

3.8 Grazing Management

North MOUT: The North MOUT is in the South Foxtrot Pasture. The pasture has a total of 4,696 acres of which 1,143 acres are not leased. The South Foxtrot pasture may be grazed by 550 head of cattle for 78 days per year under a rotation grazing system where they are in the pasture for about two weeks then out for about ten weeks, five times a year. The affected area is only 26 acres (about 0.55% of total acres) and is very small in comparison to the total size of the pasture.

South MOUT: The South MOUT is in Echo Pasture. The pasture has a total of 6,097 acres in it. Cattle have access to the total acres, but 884 acres are not in the lease nor included in the carry capacity of the pasture. The pasture may be grazed with up to 950 head of cattle for 99 days per year under a rotation grazing system where the cattle are in the pasture for about two weeks, seven times a year.

3.9 Forestry

About two dozen, small slash pine are within the North MOUT. A remnant slash pine plantation consisting of about five acres is located adjacent and northwest of the North MOUT. None of these trees are considered of value to the forestry program due to the small number of trees and remote location. These trees are not managed for forest products. There are no trees in or near the South MOUT.

3.10 Fish and Wildlife

The North MOUT occupies a South Florida flatwoods ecosystem – a type of pine forest. Typical wildlife species include deer, quail, turkey, bobcats, skunks, raccoons and possums. This ecosystem has song birds, especially warblers (Mullahey et. al. 2006). Federally listed threatened and endangered animal species in the North MOUT were described in detail in the construction MOUT EA. In general, the Florida grasshopper sparrow (FGS), red-cockaded woodpecker (RCW), and Florida scrub-jays (FSJ) habitats are not in the North MOUT proper. Their habitats are located 330 meters or more away.

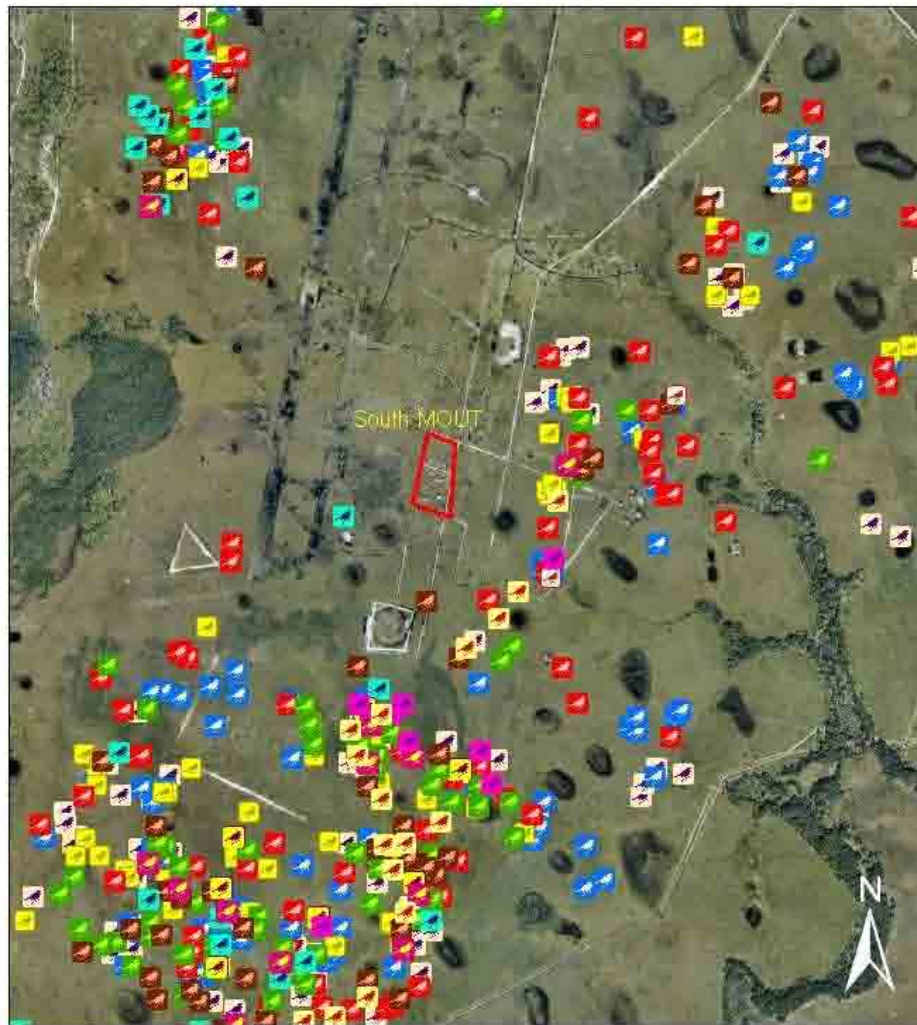
The eastern indigo snake has a very broad habitat and the habitat has not been formally delineated at APAFR. The North MOUT is in the eastern indigo snake's habitat. A survey conducted on 11 October 2007 resulted in six gopher tortoise burrows being located within the proposed construction area of approximately one acre in size (see Appendix D). Gopher tortoise burrows are of interest because the burrows can become a home for the eastern indigo snake.

The South MOUT is in the Florida dry prairie ecosystem (SCS 1989). Grasses and forbs dominate the landscape while fire resistant shrubs, such as palmetto and runner oak, occupy slightly higher ground. The South MOUT occupies slightly higher ground than the surrounding, immediate landscape. Common wildlife species include box turtles, mice, skunks, black racers, nighthawks, and meadow larks (Myers and Ewel 1990). Due to recent past disking, early succession plants occupy the South MOUT so the number and diversity of fauna species is probably lower than expected when compared to an ecosystem with later successional plants.

The South MOUT contains marginal FGS habitat. FGS are monitored by listening for male FGSs singing to establish territory. Records of FGS singing locations since 1996 have shown FGS not occupying the South MOUT location, even prior to the South MOUT being built in 2001 (Figure 3.10-1 and 3.10-2). It is worth noting that survey/listening posts were not established within the South MOUT area and mock airfield because the existing road network was determined to diminish habitat quality to the point where territories would not be established by the male birds (Figure 3.10-3). The closest occupied FGS territories are 300 meters away. It is possible, however, that the South MOUT is a foraging area for the sparrow.

The population of FGS at APAFR declined dramatically from a maximum estimate of 298 birds in 1997 (Delaney et al 2002) to 14 birds in 2006, a 95% decline (Tucker and Bowman 2007). APAFR is the only federally managed land that harbors FGSs and has historically supported three sub-populations. The three APAFR sub-populations are in Delta Trail/OQ Range located in the west central portion of APAFR, the North Tactical and North Conventional Ranges (now extirpated), and the South Tactical Range. The South Tactical Range sub-population is significant for the following reasons: 1) it consistently has greatest number of birds; 2) it harbors the largest area of Florida dry prairie at APAFR (Delaney 2002); 3) it is believed to be acting as a population source; and 4) in 2006 two immigrant birds from nearby Kissimmee Prairie Preserve State Park (east of APAFR across the Kissimmee River) were found in the South Tactical Range. Therefore perpetuating the South Tactical Range source (with potential for FGS immigration) sub-population may be crucial to the survival of the FGS at APAFR. Perkins et al (2003) found that FGS occupied habitats less than or equal to 400 meters from edges (i.e. with vegetation greater than three meters tall, or exotic grass pasture) were population sinks (i.e. mortality exceeds reproduction). Fragmentation and creation of edge effects have been documented to adversely affect the FGS (Perkins et al 2003). The replacement of native dry prairie vegetation with any structures or vegetation exceeding three meters in height and/or conversion to exotic grassy areas at the South MOUT has the potential to create "edge effects" and further fragment the remaining

South MOUT with locations of FL Grasshopper Sparrows



Legend

	FGS males 1996		FGS males 2000		FGS nests + males 2004
	FGS males 1997		FGS males 2001		FGS nests 2005
	FGS males 1998		FGS males 2002		FGS nests + males 2006
	FGS males 1999		FGS males 2003		FGS nests + males 2007



Figure 3.10-1. Florida grasshopper sparrow inventories from 1996 through 2007 in the South Tactical Range at Avon Park Air Force Range, Florida.

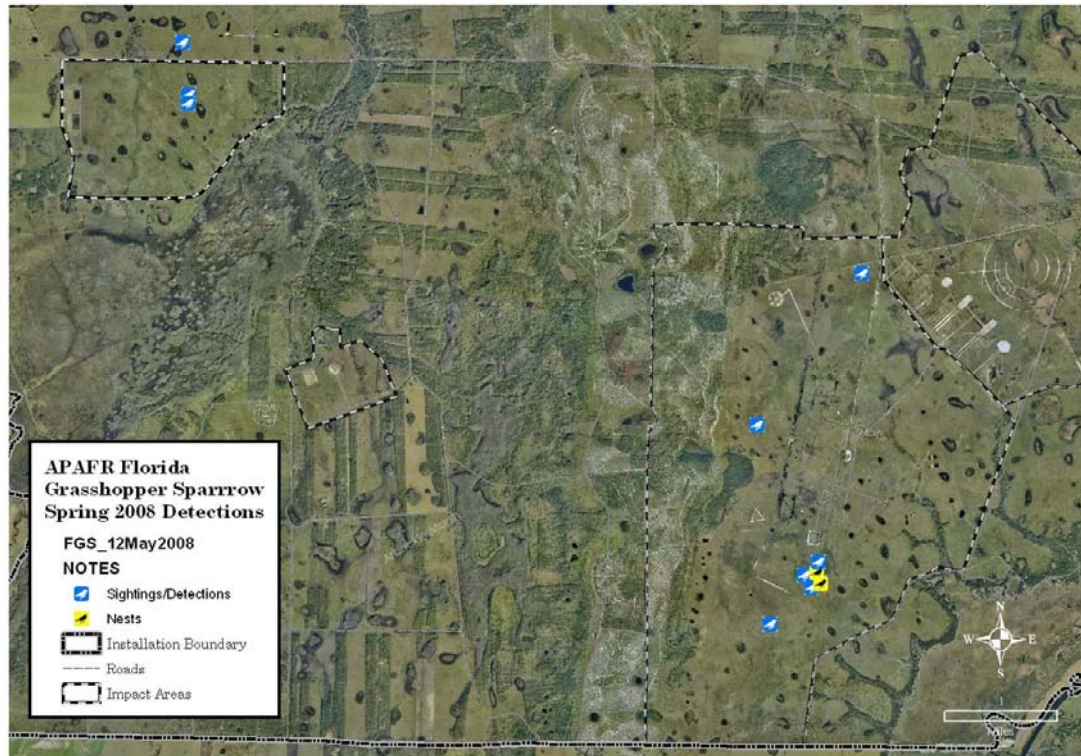


Figure 3.10-2. Florida grasshopper sparrow inventory for 2008 in the South Tactical Range at Avon Park Air Force Range.

Florida dry prairie within the core of the Echo Range sub-population. This coupled with the short lifespan of the FGS give reason to be seriously concerned about the long-term viability of FGSs at APAFR. In fact a population viability model developed for the FGS at APAFR (Vickery and Perkins 2003) suggest a relatively high probability of extirpation from APAFR within the next 50 years or less.

The eastern indigo snake can occupy Florida dry prairie, but given the high water table of this site, gopher tortoise do not have habitat or territories reaching the South MOUT.

3.11 Recreation

Public and military recreation is not authorized in the North Tactical Range where the North MOUT is located nor in the South Tactical Range where the South MOUT is located. Game species are present in both ranges and are monitored for population estimates range wide. However, no game species population monitoring is done specifically for the MOUT areas.

Feral hogs are trapped and removed from the North Tactical Range to manage for damage and population control. On average, 10 to 20 hogs are trapped annually.

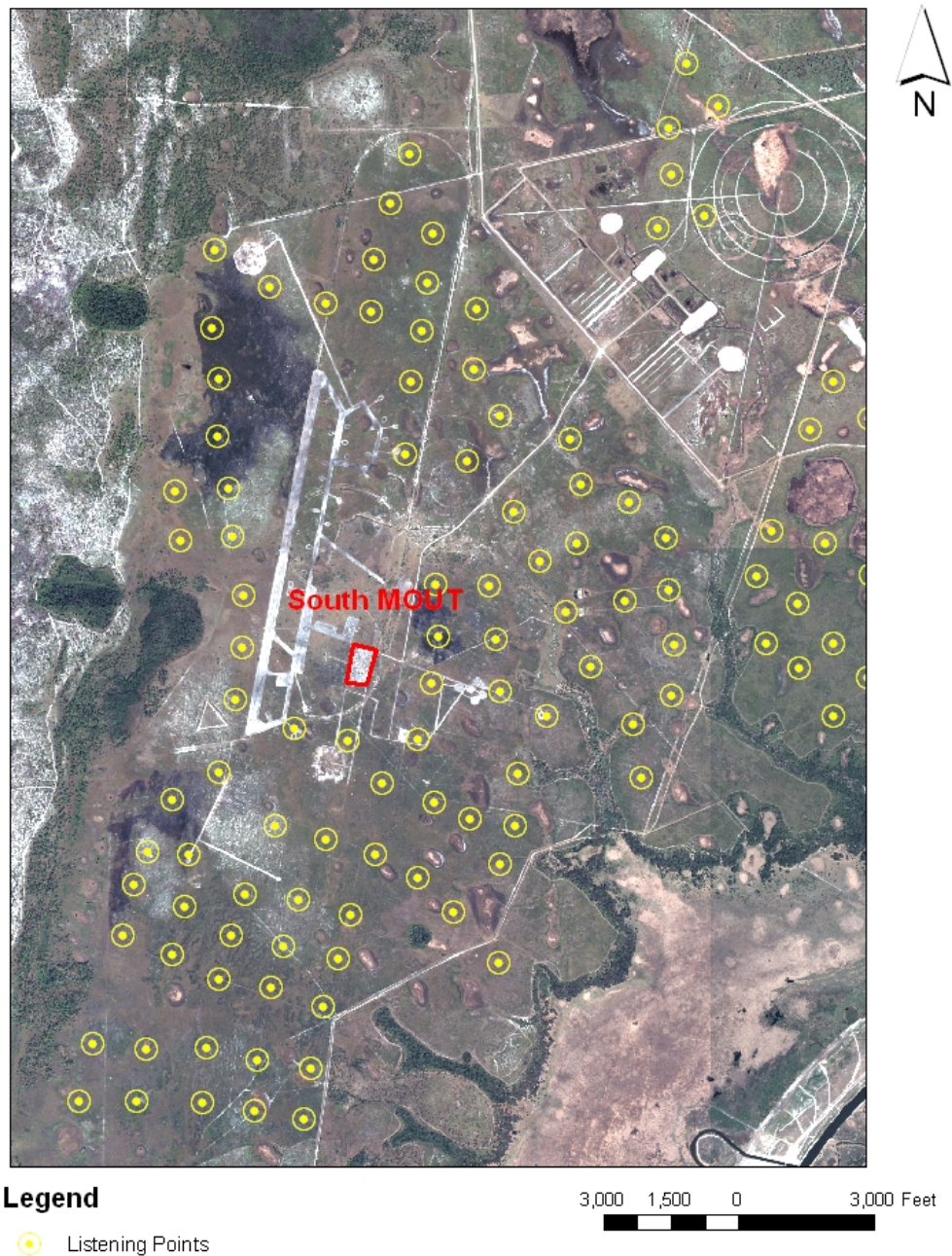


Figure 3.10-3. Florida grasshopper sparrow listening points in the South Tactical Range at Avon Park Air Force Range, Florida.

3.12 Military Training

Both the North and South MOUTs are utilized by the two of the larger training events at APAFR– Atlantic Strike and Jaded Thunder. Both training events utilize TACPs, friendly and opposition forces, and coordinated air-to-ground delivery of ordnance and gunnery. Jaded Thunders adds the complexity of ground-to-ground ordnance consisting of mortars, howitzers, and rockets directed by Army forward observers. These exercises

typically employ 300 to 500 personnel, 20 to 50 aircraft, 20 to 75 vehicles, and in the case of Jaded Thunder, 16 to 24 field guns including mortars, howitzers, and rocket launchers. Both exercises occur in the spring and fall. Both exercises last seven to ten days.

Smaller scale exercises having the same attributes as Atlantic Strike and Jaded Thunder also occur in the MOUTs, particularly the North MOUT. The frequency varies, but there is at least one exercise per month involving ground forces in the MOUTs.

3.13 Cultural Resources

Definition of the Resource: Cultural resources comprise prehistoric or historic sites, districts, buildings, structures, objects, and other evidence of human activity. These include: archaeological resources, historic architectural and engineering resources, and traditional cultural properties. Archaeological resources are locations where human activity has altered the earth or left deposits of physical remains (e.g., stone tools, bottles, structure ruins). Historic architectural and engineering resources include standing buildings, dams, canals, bridges, and roads. Buildings generally must be 50 years or older, although military structures from the Cold War era (1946 to 1989) can be considered significant if they are of exceptional importance to the Cold War military mission. Traditional cultural properties are associated with the practices and beliefs of a living community. Significant cultural resources are those that are eligible or potentially eligible for inclusion in the National Register of Historic Places (NRHP) or that are important to traditional groups as outlined in the *American Indian Religious Freedom Act* (AIRFA), the *Native American Graves Protection and Repatriation Act* (NAGPRA), and Executive Order 13007. Cultural resources that are unevaluated for NRHP-eligibility are treated as potentially eligible until evaluation is complete.

The U.S. Air Force is required to comply with Section 106 of the *National Historic Preservation Act* (NHPA), including SHPO and American Indian consultation, during the EA process. In 1999, the DoD promulgated its American Indian and Alaska Native Policy that emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the armed services.

Identified Cultural Resources: As of 2007, more than 150 cultural resources consisting of prehistoric, historic, and multi-component sites had been recorded on APAFR. Of these sites, 18 were determined to be eligible or potentially eligible for the NRHP. Currently, no resources on APAFR are listed in the NRHP (NRIS 2007). In 2004, Parsons Engineering Services, Inc. conducted a Phase I cultural resources survey encompassing the whole of the North MOUT area. In 1985, Piper Archaeological Research, Inc. conducted a Phase I cultural resources survey encompassing the whole of the South MOUT area. Both investigations included systematic subsurface testing to locate any historical resources in the area. Both investigations have been reviewed by the Florida Office of the State Historic Preservation Officer and meet the requirements for

sufficiency. No cultural materials were identified within or near the proposed area of potential effect for any of the proposed actions.

There are no known traditional cultural properties on APAFR associated with American Indian traditions or beliefs. One Euro American traditional cultural property, Fort Kissimmee Cemetery, is associated with the earliest Euro American settlers of the region. Members of the Fort Kissimmee Cemetery Association retain ownership of the parcel of land containing the cemetery, as well as a small piece of property that extends to the Kissimmee River. The Association maintains the cemetery and continues to inter their dead at that location (USAF 2003).

3.14 Coastal Zone Management

The Coastal Zone Management Act (CZMA) of 1972 assists coastal states to develop coastal management programs to manage coastal resources. The Florida Coastal Management Program relies on various state agencies to implement 23 statutes that protect coastal resources. The FDEP directs the coastal management program. APAFR lies within two counties that, despite being inland, are still considered coastal counties by FDEP. FDEP's main management focus for inland counties is water quality of creeks and rivers that reach estuaries.

Two waterways border APAFR – Arbuckle Creek to the west and the Kissimmee River to the east. These waterways are in the Lake Okeechobee/Everglades watershed. Water from Lake Okeechobee flows through the everglades either as surface water flow or in man made canals. Both the surface flow and canals reach ocean waters.

As discussed above in Section 3.3 Water Resources, APAFR does not meet FDEP standards for water quality in the Morgan Hole Creek subset watershed regarding fecal coliform and dissolved oxygen. APAFR currently has an implementation plan for improving water quality in this subset watershed.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Airspace and Aircraft Operations

With MOUT sites already established and used extensively for small operations as well as large force exercises, airspace use and aircraft operations are mostly set and established in the area of operations. Increasing the size and quality of the North MOUT would have little to no effect on airspace requirements. Improved quality and size of the North MOUT has the potential to draw more attention and activity from troops on the ground, but airspace requirements would be unaffected with only a small potential to attract additional aircraft.

4.2 Safety

Safety assessed the differences amongst the alternatives - the addition of roads, construction site preparation, seeding grass, and mowing and disking maintenance.

4.2.1 Proposed and Alternative Actions

From the examples in Section 3.2 *Safety*, the Danger Index would remain the same for the example of the aircrew for both the North and South MOUTs. For the Marine and AF TACP example in the North MOUT, the Danger Index would be HS=4, RP=0.25, E=Level 4 with a resulting DI=25 Medium Priority. The RP was increased from 0.05 to 0.25 due to vehicles being able to access multiple roads and intersections. This would increase the risk for damage to the vehicles by possibly hitting buildings or other vehicles. There would also be an increase in a vehicle hitting a pedestrian. In summary, due to an increased road network in the North MOUT under the Proposed and Alternative Actions, any exercise that involved vehicles would have a higher Danger Index when compared to the existing baseline condition of only four main roads.

Craters created by ordnance would be filled in, thus minimizing their risk to safety.

4.2.2 No-Action Alternative

The No-Action alternative would limit training to existing buildings only because the new buildings would not be stable. ORM for the North MOUT would not consider training in the new buildings due to unacceptable risk. AFI 90-901 Section 3.1 states “Accept no unnecessary risk”. Unnecessary risk comes without a commensurate return in terms of real benefits or available opportunities.” The No-Action alternative would construct unstable buildings posing unnecessary risk to military training and target maintenance crews. There are no foreseen opportunities to establish, to train, and to maintain unstable buildings. At best, existing, stable buildings could be used for training while the newer buildings would be avoided and used primarily for aesthetics. The South MOUT would not have new buildings or new roads and would have no changes to safety from baseline conditions.

4.3 Water Resources

4.3.1 Proposed Action

The Proposed Action for the next development effort would not impact stormwater runoff because it would be retained in a detention pond. As the North MOUT would be developed over time, stormwater runoff would not be increased due to implementation of detention ponds. Furthermore, development of the North MOUT would reduce existing stormwater runoff within the identified erosion area above the noted gully because the additional detention ponds would collect stormwater runoff from already existing developed areas. Overall, stormwater runoff would be decreased to 46.45 acre feet or a decrease of ten percent over existing conditions. The existing erosion area with the gully headcut would be expected to continue, however. It is anticipated that runoff from the gully would not adversely affect the stability of Morgan Hole Creek within the North Tactical Range.

The Proposed Action would not impact water quality for Morgan Hole Creek. Fecal coliform levels would remain above state standards.

4.3.2 Alternative Action

Impacts for the Alternative Action would be similar to the Proposed Action except that stormwater runoff could be slightly less due to increased water infiltration and retention caused by the seeded bahia grass.

4.3.3 No-Action

The No-Action alternative would not increase storm water runoff if construction and training took place as originally proposed in the construction and expansion MOUT EAs due to minimal surface disturbance and intact vegetation. Runoff would continue as described in Section 3.3 Water Resources.

4.4 Geology and Soils

4.4.1 Proposed Action

Under the Proposed Action, approximately 9.2 total acres would be directly affected in the short term; 1.5 acres at the North MOUT and 7.7 acres at the South MOUT site. Long term, up to 26 acres would be impacted in the North MOUT, 7.7 acres for the South MOUT. For the North MOUT, the placement of shell and/or clay fill into an otherwise acidic environment would permanently change the soil pH and associated soil chemistry of an otherwise acidic edaphic environment. The soil chemistry and soil pH changes that result from the addition of off-site calcareous material have been outlined by researchers in Central Florida (Gordon et al, 2005; Greenberg et al, 1997). In general they noted that clay and shell had soil pH and nutrient differences that differed significantly from unmodified soils (Greenberg et al, 1997).

For the North MOUT, increased vehicle activity would be expected to result in an increase in onsite soil erosion, especially on disturbed sites. Offsite soil erosion would be curtailed by the creation of detention ponds. Other impacts include soil compaction of

surface soils and disruption of soil integrity due to these activities. Indirect soil impacts are those due to disturbance of ground cover vegetation by activities associated with preparing the site (scraping soil, leveling, etc.) for the MOUT containers. Ground disturbance activities like these, when the natural vegetation is either removed or displaced, will leave the soil susceptible to erosion and compaction.

For the South MOUT, disking once or twice annually would not change soil pH, but would change soil structure and water holding capacity.

For both the North and South MOUTs, indirect impacts due to disturbance of the ground cover vegetation by vehicular activity or disking would promote soil erosion. The soils are considered highly erodible and have low organic matter content and are subject to wind and water erosion. Given the increase in runoff west of the North MOUT in an already eroded area, soil erosion would be accelerated – mainly by the active gully. Sand would continue to be deposited in a large seepage swamp that forms the headwaters of Morgan Hole Creek.

Foot traffic and hoof action by cattle would continue to leave trails in both MOUTs.

4.4.2. Alternative Action

The environmental consequences are the same to those outlined above in 4.5.1 for both MOUTs. Any proposed usage of lime and/or fertilizer would also permanently alter the physical soil properties and soil profile, and would ultimately alter the spodic horizon for the North MOUT. Foot traffic and hoof action be less likely to leave trails and erosion would be expected to be slightly less if bahia grass were to established.

4.4.3. No-Action Alternative

Under this alternative no changes to the MOUT sites would be made at APAFR and therefore the least amount of potential affects would occur, with the exception for impacts associated with continued training events at the MOUT sites. However even under this alternative, long-term usage of the sites by vehicles, ordnance delivery, foot and hoof traffic, and the resultant repeated disturbances would ultimately cause some limited permanent alteration to both the physical properties of the soils at both sites. Erosion would continue, but less than the Proposed and Alternative actions.

4.5 Vegetation

4.5.1. Proposed Action

Under the Proposed Action at least 9.1 total acres of a native plant community would be lost in the short term. Of this at least 0.90 acres or more of intact, frequently burned, diverse native groundcover vegetation characteristic of dry pineland vegetation at the North MOUT would be lost due to disking. At least 8.2 acres of “Florida dry prairie” at the South MOUT site would also be lost due through disking activities. Long term, if the North MOUT were entirely developed up to 33.2 acres of native plant community would be permanently lost for both MOUTs.

At the North MOUT the native, intact perennial (predominantly wiregrass, *Aristida beyrichiana*) ground cover vegetation (157 plant species recorded from this type, Bridges & Reese 1999) would be replaced by a few annual, weedy plant species once the site is scraped and leveled. Annual weedy replacement species characteristic of nearly disturbed sandy sites are expected to recolonize the disturbed sandy soils, such as: blue lovegrass (*Eragrostis elliottii*), *Dichanthelium portericense*, needlepod rush (*Juncus scirpoides*), pine barren flatsedge (*Cyperus retrorsus*), slender goldentop (*Euthamia minor*), and thin paspalum (*Paspalum setaceum*).

At the South MOUT the native, intact perennial (predominantly wiregrass, *Aristida beyrichiana*) ground cover vegetation and other long-lived perennial species characteristic (146 plant species have been recorded from this type; Bridges & Reese 1999) of the wet-mesic, spodic prairie will be replaced by a few annual, weedy plant species once the site is scraped and leveled.

The addition of clay or shell would dramatically impact the native vegetation not only where this activity occurs but it would also impact the surrounding vegetation. Adding shell will change the soil pH of an otherwise acidic landscape and eventually would shift the vegetation composition from an otherwise acidic flora towards a “weedy” calcareous flora. Over time these changes would favor non-indigenous and exotic plant species. Specifically, natalgrass (*Rhynchelytrum repens*), cogon grass (*Imperata cylindrica*), both invasive exotics have the potential to become established. This is because disturbed soils greatly increase the overall invasibility factor of sites for establishment of exotic and adventive plants. The addition of shell and or clay to the sandy soils may favor the establishment of sandburs (*Cenchrus* sp.). Sandburs are a nuisance to humans since that develop a thorny seed that easily becomes attached to the clothing, shoes, and socks of persons traversing its habitat. The thorny *Cenchrus* seeds can create considerable discomfort to those unfortunate enough to pass thru fruiting patches especially since it can produce seed throughout the year in South Central Florida where conditions are favorable throughout most of the year.

The proliferation of non-indigenous species, created by disturbances poses a threat to the native biodiversity by altering species composition. This is especially true when adding shell or clay to sandy areas which will dramatically enhance invasion by non-indigenous plants which can eventually become established and spread into otherwise undisturbed native ground cover vegetation. The invasion of non-indigenous plants into an otherwise native groundcover landscape would degrade the native biodiversity.

4.5.2. Alternative Action

Under the Proposed Action approximately 9.2 total acres would potentially be affected in the short term; 1.5 acres at the North MOUT and 7.7 acres at the South MOUT site. Up to 33.7 acres would be potentially lost in the long term. The consequences would be similar to those outlined above in 4.6.1. Due to the drought susceptible soils in the North MOUT, establishment of bahia grass from seeding would be tenuous and even if successful, forming a thick sod would be unlikely. Weedy species would still inhabit the post disturbance site, but perhaps in less density that if the site were not reseeded with

bahia.

4.5.3. No-Action Alternative

Under this alternative no changes to the MOUT sites would be made at APAFR and therefore the least amount of potential affects would occur with the exception for impacts associated with continued training events at the MOUT sites. Even though under this alternative the least amount of ecological damage would occur, long-term usage of the sites by vehicles, personnel, ordnance deliveries, and the resultant repeated disturbances would result in replacement of the perennial grasses and forbs with a flora dominated by annuals, weedy plant species, and potentially noxious, invasive plants.. The ecological integrity of the natural vegetation at both MOUT's would be compromised.

4.6 Invasive Plant Species

4.6.1 Proposed Action

TSA and cogan grass are both candidates for possible invasion into the North and South MOUT areas. Any sort of soil disturbance, such as disking as proposed, would create sites for possible invasion: however, the risk would be low because there are no populations in the immediate vicinity. The greatest potential for introducing cogan grass would be by vehicles entering the MOUTs. The greatest potential for introducing TSA would be by grazing cattle. As more areas would be disked, the potential for infestation would increase. The areas would be monitored for invasive plants annually and if any are located they would be scheduled for treatment with an approved herbicide. Contractor commitment to treating noxious weeds in impact ranges has not been strong. A strong commitment for treating noxious weeds, if they should establish in the MOUTs, must be made. If cogan grass becomes established, wildfires would become hotter, more destructive, and favor cogan grass. Cogan grass would adversely affect management and training in the MOUTs because of the fire danger. If TSA would be established, mowing around buildings for military training would reduce the vigor of TSA and could help reduce the number of plants if timed well with chemical spraying.

4.6.2 Alternative Action

Seeding the disked soil with bahia grass in the North MOUT would reduce the potential of invasive plants establishing if the bahia grass were to establish. The bahia grass would not prevent invasive plants from invading the site, but it would reduce the potential. Anytime you have a good turf ground cover invasion by invasive plants is reduced. Invasive species monitoring and control would still be accomplished. Impacts to the South MOUT would be the same as those for the Proposed Action.

4.6.3 No-Action Alternative

North and South MOUT: The potential for invasive species to establish would be less due to less ground disturbance and fewer roads with imported shell/clay material. Still, past disking, the main road being of shell/clay material, continued foot traffic, and disking the immediate area of the building sites would provide somewhat of an opening for the invasion with invasive plants. The risk is low because there are no active colonies in the immediate area. Therefore the potential affect to the environment would be small.

4.7 Fire Management

Fire management would not be expected to change with the Proposed Action, Alternative Action, and No-Action alternative for the North and South MOUTs. This is because existing conditions of the buildings themselves, existing road networks, trampling by training personnel and cattle, and grazing by cattle all reduce fire fuel loads or make fuels discontinuous so that fire does not burn continuously through the MOUTs during prescribed burning or wildfires. The intensity of development under the various actions really would not change fire behavior from existing conditions. Ordnance created wildfires currently burn patchy patterns in the MOUTs and would be expected to continue under all actions.

4.8 Grazing Management

4.8.1 Proposed Action

This action would have little impact to the grazing program. The expansion of the village would be small in comparison to the size of the pasture. There would be no additional affect to the grazing program.

4.8.2 Alternative Action

This action would have a small positive impact to the grazing program. The seeding of the disked areas with bahia would provide additional forage in the pasture. Because the amount of area seeded would be small, the additional forage would not affect the over all use of the pasture by the livestock.

4.8.3 No-Action Alternative

The No-Action alternative would not affect the grazing program.

4.9 Forestry

None of the actions would affect the forestry program. The goals of the forestry program would not have input on the management of the trees near the North MOUT, but would defer management to either wildlife or military training goals.

4.10 Fish and Wildlife

The USFWS has issued previous biological opinions to APAFR requiring briefings to range users and equipment operators on avoidance procedures when encountering threatened and endangered species or reporting procedures when encountering sick, injured, or dead species (USFWS 2007, USFWS 2007a). This briefing would be given to personnel training with, constructing, or maintaining the MOUTs.

North MOUT: All actions would construct buildings, have training, and in general displace wildlife to some extent.

For the Proposed Action, APAFR's informal consultation with the United States Fish and Wildlife Service (USFWS) resulted in concurrence of may affect, but not likely to adversely affect the FSJ, RCW, and the eastern indigo snake. APAFR offered and the

USFWS concurred with the conservation measure of training for ground personnel involved with the construction, maintenance, and use of the MOUT in identification and avoidance of the eastern indigo snake. Also, the conservation measure of tortoise or other burrows that could not avoid damage due to construction or maintenance would be excavated with gopher tortoises relocated and eastern indigo snakes allowed to move away from the burrow site on their own volition. MOUT Construction or maintenance would resume after the snake left the burrow. The Alternative Action would require the same conservation measures. The No-Action alternative would require ground personnel training for identification and avoidance of the eastern indigo snake. Gopher tortoise burrows could be avoided with construction and would not require the excavation of gopher tortoise burrows. Inspections for tortoise burrows would be required every time the North MOUT would be expanded under any alternative, including the No-Action alternative.

South MOUT: Disking the South MOUT would continue under the Proposed and Alternative Actions. Lower diversity of fauna would be expected.

No survey of singing FGS males have been documented within 300 meters of the South MOUT even before the South MOUT was constructed. Although the South MOUT lies within the Florida dry prairie landscape of Echo Range, the habitat of the FGS, it is currently unoccupied. While disking of dry prairie habitat under the Proposed and Alternative actions would not likely directly impact breeding activities of the FGS, it would ultimately result in the loss of FGS habitat and reduce the potential for the FGS to reoccupy the site.

4.11 Recreation

Proposed Action, Alternative Action, and No Action alternatives would not affect the public recreational hunting. The Proposed Action and alternatives would not affect the monitoring of game species, their populations or the live trapping of hogs.

4.12 Military Training

This Proposed and Alternative actions would allow for increased realism in training. A larger village with multiple avenues of approach would allow for realistic scenarios to be developed. Leaders and troops would be offered the ability to make tactical decisions in a village with multiple buildings and streets on how to safely ingress and egress a village by vehicle and foot.

The increase in size would enhance troop's abilities to direct air strikes in an environment of numerous buildings and roads. A larger village would also increase the pilots training on picking very specific targets within the town thus making the tactical decisions on how to employ weapons without damage to the local population and collateral damage to buildings and infrastructure.

The current size and layout of the village limits their training objectives and scenario opportunities. The leaders are not able to mitigate ambush and IED sites because there is only one main road in and out.

This action would allow for more vehicle travel on other streets and avenues within the village but would not necessarily increase the amount of vehicles. Foot traffic would be remain about the same, perhaps slightly less as the urban area would be expanded and hardened streets would be established.

The No-Action alternative would still allow training but on a smaller, very basic level. Training scenarios would be very limited without the ability to adapt to current world situations.

4.13 Cultural Resources

Both the North and South MOUT areas were subjected to cultural resources assessment surveys. There were no cultural resources identified in either area. APAFR entered into a Section 106 consultation as required by the NHPA via letter correspondence to the State Historic Preservation Office (SHPO) on 4 October 2007 (see Section 6.0 Agencies and Publics Contacted). APAFR determined no effect to cultural or historic resources,

APAFR initiated tribal consultation with eleven tribes on 4 October 2007. On 9 October 2007 the Seminole Nation of Oklahoma responded via e-mail that they concurred with the determination that there no cultural, historical, or religious site of the tribe would be affected with the Proposed Action. Additionally the tribe requested that if any human remains, funerary objects or other associated objects dating from the 1720's to the 1850's are uncovered, to contact them immediately.

4.13.1 Proposed Action

All of the areas effected by the proposed actions have been subjected to Phase I cultural resources assessment surveys. Within the surveyed area, no cultural resources eligible for listing in the NRHP have been identified. The proposed action would have no effect on cultural resources. The No-Action alternative would have no effect on significant cultural resources.

4.13.2 Alternative Action

Alternative Action: The Alternative Action's activities would not have an impact, no known cultural resources exist on or within the vicinity of the project area.

4.13.3 No-Action Alternative

No-Action Alternative: No known cultural resources exist on or within the vicinity of the project area, therefore the No-Action Alternative would not have an impact.

4.14 Coastal Zone Management

The Proposed Action, Alternative Action, and No-Action alternative would be in compliance with the Florida Coastal Zone Management Plan and would have no adverse affects on coastal zones following a review of the 23 state statutes.

4.15 Relationship Between Short-term Use of the Environment and the Maintenance and Enhancement of Long-term Productivity

Short term use of the environment is defined as the input and opportunity cost of upgrading the North and South MOUTs in relation to the long term productivity of the MOUTs that would be gained. Construction and maintenance of the North MOUT under all actions would require down time of the North Tactical Range resulting in lost training opportunities. However, generally the South Tactical Range would be able available so that the loss of training opportunities would be minimal. The longer term productivity would be a more realistic training environment for both MOUTs. The long-term ecological productivity of the native flora and fauna and both MOUT sites would be dramatically reduced and essentially lost for the Proposed and Alternative Actions. Furthermore the long-term productivity of both MOUT sites to support habitat for the indigo snake would be permanently altered. The long-term productivity of the South MOUT to continue to support the native dry prairie vegetation, the natural habitat of the FGS, would be lost. Furthermore the production of fine-fuel biomass contributed by the native groundcover vegetation which carries fire across the MOUT landscapes and aids in maintenance of species habitats would be lost.

4.16 Irreversible and Irretrievable Commitment of Resources

Fossil fuels would be irretrievable resources used during construction, maintenance, and ordnance training activities. These resources would be relatively small. Further, regardless of whether the Proposed, Alternative, or No Action alternatives would be implemented, a similar level of maintenance and training activities would occur and so a similar level of resources would be consumed.

The Proposed and Alternative Actions would create long-term, irreversible impacts to both the soils and native vegetation in the North MOUT. Long-term soil properties could not be reversed with the addition of clay/shell roads. Natural vegetation communities (being replaced by off-site, non-indigenous species and increased early seral plants) would be an irreversible impact that could not be restored. For the No-Action alternative, newer developed portions of the MOUT could potentially be restored to native vegetation communities, while existing development involving the clay/shell road could not be restored.

Under the Proposed and Alternative Actions for the South MOUT, the opportunities to restore the site to a native vegetation community would be irretrievably lost with continuous disking due to changes in the soil profile and establishment of invasive plant species. The No-Action alternative would have potential for restoration.

4.17 Cumulative Impacts With Direct and Indirect Effects

Impacts to the resources involved were cumulatively assessed in this EA as well as considering past, present, and reasonable foreseeable future actions.

North MOUT:

The proposed actions under the previous construction and expansion EAs for the North MOUT were designed to minimize environmental impacts by minimizing soil disturbance, leaving natural vegetation intact, and having fire maintain the pine flatwoods

ecosystem. The assessments in these EAs concluded that development and training would not significantly change the existing environment. The current, actual result of expanding the urbanization and training in the North MOUT has had more adverse impacts than what was expected and assessed previously. These departures from original construction methods and training with explanations of why they have occurred were listed in Section 1.3 of this EA. Never-the-less, the result is that current baseline conditions are more tenuous for maintaining environmental stability of the North MOUT and the surrounding landscape when assessing impacts with this EA, even when assessing the No-Action alternative. Furthermore, environmental conditions have either changed or more information is available since the previous construction and expansion EAs so that the impacts were reassessed. Specific changes included:

- A stronger emphasis on the impacts to the gopher tortoise due to their beneficial relationship to the federally threatened indigo snake – enough that a gopher tortoise burrow survey was conducted resulting in a high density of burrows being located.
- A heightened emphasis on noxious, invasive weed management in areas other than the cantonment/main base area of APAFR resulting in a heightened awareness of noxious weeds spreading on the rest of the installation and implementation of control measures to halt the spread of invasive weed species.
- A field survey and report that has identified excessive soil erosion in the North Tactical Range, of which the North MOUT is part of.

The core concept for cumulative impacts of any action to the North MOUT is that of ecological cascading. Ecological cascading is defined as the sum of environmental impacts is greater than the parts and that when collectively considered, the ecological integrity of the North MOUT and surrounding landscape is compromised.

For the Proposed Action, ecological cascading impacts would include the North MOUT becoming vegetatively ecologically unstable (due to soil characteristic changes and reduced fire maintenance) resulting in potentially being a host site for noxious, invasive weeds that can then establish in other locations in the North Tactical Range as transported by vehicles. The North MOUT is a common vehicle gathering point for training and maintenance activities.

For the Alternative Action, ecological cascading would be applied and would include the same soil changes scenario and the same vegetative ecological stability, however, the use of bahia grass as a plant cover would possibly somewhat reduce the risk of noxious, invasive plants from establishing.

For the No-Action alternative, ecological cascading would be applied due to compromises in safety according to ORM and some lost vegetative ecological stability due to traffic from training and the potential for invasive, noxious weeds establishing in the North MOUTs and spreading to other locations.

South MOUT:

The South MOUT also had factors change from the previous EAs that affected the assessment of this EA. They were:

- The entire South MOUT site has been disked.
- A heightened emphasis on noxious, invasive weed management in areas other than the cantonment/main base area of APAFR resulting in a heightened awareness of noxious weeds spreading on the rest of the installation and implementation of control measures to halt the spread of invasive weed species.
- The FGS has dramatically declined in numbers at APAFR and this reduction has focused on the importance of the largest remaining quadrant of FGS dry habitat prairie at APAFR – also where the South MOUT is located. This quadrant considered the core area offering a chance for the species to perpetuate and expand in population. Taken in context, the FGS dry prairie historically ranged to approximately 24,242 acres (9,697 ha) scattered in four geographic quadrants on APAFR. Currently it is estimated that approximately 9,192 acres (3,677 ha) remains. The southeast quadrant historically had the largest extent (13,625 acres or 5,450 ha) of FGS dry prairie landscape (Bridges 2000). The southeast quadrant once accounted for nearly 38% of the prairie landscape at APAFR and includes parts of South Tactical Range where the South MOUT site is located. Therefore the further reduction in the acreage of dry prairie at APAFR within the largest remaining Florida dry prairie landscape on APAFR with a potential to establish and spread noxious weeds represents a cumulative impact to FGS habitat. The opportunity to maintain the Florida dry prairie landscape in a rather large continuous tract such as those remaining at APAFR would be limited. The Proposed and Alternative Actions would further diminish this potential.

The Proposed and Alternative Actions would also be considered ecological cascading due to soil instability from disking one to two times annually and being a frequent gathering spot for vehicles with the potential to introduce and establish noxious weeds in the South MOUT, then transport the noxious weeds to other locations in the area. Transport would be of particular concern from the South MOUT to other locations in the FGS dry habitat prairie.

The No-Action Alternative would not consider ecological cascading because the native vegetation would recover with the absence of disking and function similar to the adjacent dry prairie.

4.18 Comparison of Actions

Proposed Action: Strengths of the Proposed Action for the North MOUT would include improved safety for personnel in concrete buildings and greater training realism and complexity for military personnel. Weaknesses would include increased risk of noxious

weed species establishing, and irreversible changes to physical and chemical properties of soil. Strengths for the South MOUT would include improved safety by filling in ordnance craters, while weaknesses would be increased risk of noxious weeds and some loss of FGS habitat.

Alternative Action: The Alternative Action has the same strengths and weaknesses as the Proposed Action, except that the risk of noxious plant species establishing in the North MOUT would possibly be reduced by establishing bahia grass.

No Action: Strengths of the No-Action alternative would be lower risk of noxious weeds establishing, no need to construct detention ponds, and fewer changes to the physical and chemical properties of the soil. Weaknesses would be increased safety risks for military personnel during training due to less stable concrete buildings and a less complex and realistic training experience. Increased risk would also be present for target maintenance personnel.

5.0 LITERATURE CITED

- ANDERSON, Hal E. 1982. *Aids to Determining Fuel Models for Estimating Fire Behavior*. General Technical Report INT-122, National Wildfire Coordinating Group.
- BRIDGES, E. L. AND G. A. REESE. 1999. *Microhabitat Characterization for the Florida Grasshopper Sparrow*. Final Report to Avon Park Air Force Range, FL. 202pp.
- CARTER, L. 1995. *Soil Survey for Avon Park Air Force Range, Florida*. Final Report to Avon Park Air Force Range, FL. 225pp.
- CREATIVE WORK DESIGNS. 2002. *Practical ORM*
- DELANEY M. F., V. RUMANCIK, and J. O. GARCIA. 2002. *Population Monitoring and Habitat Management of the Florida Grasshopper Sparrow at APAFR and Regional Habitat Mapping and Distribution*. Annual Report 15.
- DELANY, M F. 2002a. *Spatial Analysis of Florida Grasshopper Sparrow Distribution on APAFR 1996-2001*. Interim Report.
- FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FFWCC). 2007. *Gopher Tortoise Incidental Take Permit Interim Policy Effective 31 July 2007*. <http://myfwc.com/permits/Tortoise/pdf/GTIT-Interim-Policy.pdf>
- FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) 2007. *Evaluation of Current Stormwater Design Criteria within the State of Florida: Final Report*. FDEP Contract No. SO108. Prepared by Harvey H. Harper and David M. Baker, Environmental Research Design, Inc. 3419 Trentwood Blvd, Suite 102, Orlando, FL 32812.
- GORDON, D. R., C. H. GREENBERG, S. H. CROWNOVER, J. L. SLAPCINSKY. 2005. *Effects of unpaved road soils on persistence of three non-native grass species*. Natural Areas Journal 25:257-262.
- GREENBERG, C. H., S. H. CROWNOVER, and D. GORDON. 1997. *Roadside soils: A corridor for invasion of xeric scrub by nonindigenous plants*. Natural Areas Journal. 17:99-109.
- MULLEHAY, JEFFERY A., GEORGE W. TANNER, AND STEVE COATES. 2006. *Range Sites of Florida*. CIR951. Wildlife Ecology and Conservation Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.
- MYERS, RONALD L. AND JOHN J. EWEL. 1990. *Ecosystems of Florida*. University of Florida Press/Orlando. 765pp.

NRIS 2007. National Register of Historic Places, June 2007,
<http://www.cr.nps.gov/nr/research/nris.htm>.

PERKINS, D. W., P. D. VICKERY, and W. G. SHRIVER. 2003. *Spatial Dynamics of Source-Sink Habitats: Effects on Rare Grassland Birds*. Journal of Wildlife Management 67: 588-599.

PIPER ARCHAEOLOGICAL RESEARCH, INC. 1985

SOIL CONSERVATION SERVICE (SCS) 1989. *Soil Survey of Highlands County, Florida*.

SOIL CONSERVATION SERVICE (SCS) 1990. *Soil Survey of Polk County, Florida*.

TUCKER, JAMES AND REED BOWMAN. 2007. *Population Monitoring and Habitat Management of the Florida Grasshopper Sparrow (Ammodramus savannarum floridanus) at Avon Park Air Force Range Annual Report 2006*. Cooperative Agreement DAMD17-99-2-9032. Archbold Biological Station, Lake Placid, FL.

UNITED STATES AIR FORCE (USAF) 1986. *A Preliminary Cultural Resource Assessment Survey of the Avon Park Air Force Range, Polk and Highlands and Polk Counties, Florida*. On file, 18 ASOG, Det 1, OLA,CEVN, Avon Park Air Force Range, Florida.

UNITED STATES AIR FORCE (USAF) 2000. *Air Force Instruction 90-91 Operational Risk Management*. 1 April 2000 www.e-publishing.af.mil

UNITED STATES AIR FORCE (USAF) 2001. *Final Environmental Assessment for Construction of Military Operations in Urban Terrain Target Arrays at Avon Park Air Force Range, Florida*. Prepared by OL A DET 1, 347OG/CEV, Avon Park Air Force Range, Florida.

UNITED STATES AIR FORCE (USAF) 2003. *Cultural Resource Management Plan of Avon Park Air Force Range, Florida*. Prepared by OL A DET 1, 347OG/CEV, Avon Park Air Force Range, Florida.

UNITED STATES AIR FORCE (USAF) 2004. *Phase I Archaeological Survey of 4,147.1 Acres, and Phase II Site Evaluations at 8HG24, 8HG767, and 8PO3405, Avon Park Air Force Range, Polk and Highlands Counties Avon Park, Florida*. On file, 18 ASOG, Det 1, OLA, CEVN, Avon Park Air Force Range, Florida.

UNITED STATES AIR FORCE (USAF). 2005. *Final Environmental Assessment for Expanding the North Military Operations in Urban (MOUT) Target Array at Avon Park Air Force Range, Florida*. Prepared by OL A DET 1, 347OG/CEV, Avon Park Air Force Range, Florida.

UNITED STATES AIR FORCE (USAF). 2005. *United States Air Force, Avon Park Air Force Range, Final Watershed Summary Status Report*. Prepared by URS Group, Inc, Orlando, Florida. Contract No. F44650-99-0005, T05043.

UNITED STATES AIR FORCE (USAF). 2006. *Final Environmental Assessment for Semi Annual Joint Integrated Fires Exercises at Avon Park Air Force Range, Florida*. Prepared by OL A DET 1, 347OG/CEV, Avon Park Air Force Range, Florida.

United States Army Corp of Engineers (USACE) 1995. *Wetland Delineation and Natural Resources Studies Avon Park Air Force Range, Avon Park, Florida*. Contract No. DACA63-90-0061. Prepared by Geo-Marine, Inc.

UNITED STATES FISH AND WILDLIFE SERVICE (USFW) 2007. *Multiple Launch Rocket Systems Expanded Training Use Areas at Avon Park Air Force Range, Florida, May 14, 2006*. Service Consultation Code 41420-2006-F-0657.

UNITED STATES FISH AND WILDLIFE SERVICE (USFW) 2007a. *Joint Integrated Fires Exercise Biological Opinion, November 2, 2006*. Service Consultation Code 41420-2006-F-6112.

UNITED STATES GEOLOGICAL SURVEY (USGS) 2007. *Hydrologic Unit Codes*
<http://nas.er.usgs.gov/hucs.asp>

UNITED STATES NAVY (USN) 2005. *Environmental Impact Statement for Navy Air-to-Ground Training at Avon Park Air Force Range, Florida*. Contract No. N68711-01-D-6205.

UNITED STATES FOREST SERVICE (USFS) 2007. *Fire Effects Information System*
<http://www.fs.fed.us/database/feis/plants/graminoid/impspp/all.html>

VICKERY, P. D. and D. W. PERKINS. 2003. *Florida Grasshopper Sparrow Population Viability Analysis and Reserve Design*. Final report submitted to USFWS, Vero Beach, Florida.

6.0 NATIONS, AGENCIES AND PUBLICS CONTACTED

Mr. Roland Poncho
Chairperson Alabama-Coushatta Tribe of Texas
571 State Park Rd. 56
Livingston, TX 77351

Pare Bowlegs
Historic Preservation Officer
Seminole Nation of Oklahoma
Wewoka, OK 74884

Mr. Bill S. Fife
Principal Chief
Creek Nation of Oklahoma
P.O. Box 580
Okmulgee, OK 74447

Mr. Steve Terry
NAGPRA and Section 106
Miccosukee Business Committee
P.O. Box 440021-Tamiami Station
Miami, FL 33114

Mr. Joe Quetone
Executive Director
Florida Governor's Council on Indian Affairs
1341 Cross Creek Circle
Tallahassee, FL 32301

Mrs. Gale Thrower
Tribal Historian
Poarch Band of Creek Indians
HCR 69 A Box 85B
Atmore, AL 36502

Mr. Tarpie Yargee
Chief
Alabama-Quassarte Tribal Town
P.O. Box 187
Wetumka, OK 74883

Ms. June Fixico
Kialegee Tribal Town
P.O. Box 332
Wetumka, OK 74883

Mr. Willard S. Steele
Tribal Historic Preservation Office
Seminole Tribe of Florida
AK-TAH-THI-KI Museum
HC 61 Box 21-A
Clewiston, FL 33440

Mr. Charles Coleman
Preservation Officer
Thlopthlocco Tribal Town
P.O. Box 188
Okemah, OK 74859

Dr. Janet Snyder Matthews, Ph.D.
Director and State Historic Preservation
Officer
Division of Historic Resources
Florida Department of State
500 South Bronough Street
Tallahassee, FL 32399-0250

Ms. Mary Ann Poole, Director
Office of Policy and
Stakeholder Coordination
Florida State Clearinghouse
Marjory Stoneman Douglas Bldg
3900 Commonwealth Blvd
Tallahassee, FL 32399-3000

Highlands County Planning Dept
P.O. Box 1926
Sebring, FL 33871-1926

Polk County Developmental Services
Drawer CS05
Bartow, FL 33831

Avon Park City Manager
City of Avon Park
110 East Main Street
Avon Park, FL 33825-3800

The Ledger
P.O. Box 408
Lakeland, FL 33802

United States Department of the Interior
Fish and Wildlife Service
1339 20th Street
Vero Beach, FL 33802

7.0 LIST OF PREPARERS

Cynthia M. Brown
Biologist, Environmental Scientist
Hydrology Program Manager
B.S., Applied Biology, GA Institute of
Technology, 1987
M.S., Environmental Management,
University of Maryland, 2007
Years of Experience: 18

Matthew D. Griffith, Contractor
Range Operations Technician
Det 1, 23 WG
Avon Park AFR, FL
AAS, Information Systems Technology -
Community College of the Air Force
AAS, Munitions Systems Technology -
Community College of the Air Force
3+ years towards BS in Business
Administration - Walden University
Years of Experience: 22

Ron Grayson - RPA, Contractor
Archeologist
Avon Park AFR, FL
Florida State University, 2004
Years of Experience: 3

Troy Hershberger
Wildlife Biologist
Outdoor Recreation Program Manager
Avon Park AFR, FL
Masters of Science, Hood College (MD),
2001
Years of Experience: 10

Clarence Morgan
Rangeland Management Specialist
Avon Park AFR, FL
B.S. Forest Resource Management
University of Idaho, 1982
Years of Experience: 20

Kurt E. Olsen
Supervisory Forester
Avon Park AFR, FL
B.S. Forestry, University of Florida,
1976
Years of Experience: 30

Steve L. Orzell
Botanist/Ecologist, Natural Resources
Avon Park AFR, FL
M.S., Southern Illinois University,
Carbondale, Illinois, 1983
Years Experience: 32

Wayne Taylor
Supervisory Forester, Fire Management
Officer
Avon Park AFR, FL
B.S., University of Florida,
Years of Experience: 5

Tod Zechiel
NEPA Coordinator
Avon Park AFR, FL
Masters of Agriculture, Texas A&M
University, 1987
Years of Experience: 18

8.0 RECORD OF CORRESPONDANCE



DEPARTMENT OF THE AIR FORCE
DETACHMENT 1, 23RD WING
AVON PARK AIR-GROUND TRAINING COMPLEX
MACDILL AIR FORCE BASE, FLORIDA, AND AVON PARK AIR FORCE RANGE, FLORIDA

2 October 2007

MEMORANDUM FOR Mr. Jim Toner
Historic Preservationist
Bureau of Historic Preservation
Division of Historical Resources
R.A. Gray Building, 4th Floor
500 South Bronough Street
Tallahassee, FL 32399-0250

FROM: DET 1, 23 WG/CC
29 South Boulevard
Avon Park Air Force Range, FL 33825-9381

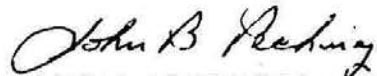
SUBJECT: Improvements to North Mount Training Complex

1. In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and *36 CFR Part 800: Protection of Historic Properties*, this letter is to notify the office of the State Historic Preservation Officer (SHPO) of proposed improvements to a mock urban village in the North Mount area of Foxtrot Range on Avon Park Air Force Range (APAFR). These improvements are needed to create a more realistic and effective training environment for service members utilizing the range. The North Mount area is located at TRS: 30E, 32S, 011 (Figure 1).
2. Various regional conflicts require a restructuring of the training facilities on APAFR to better simulate conditions that US personnel will encounter. To accomplish this goal, APAFR must redesign and rebuild its current North Mount Training Complex from an Eastern European (Cold War) setting to one more fitting the regions where troops are deployed.
3. To allow for a flexible training environment and the ability for APAFR to quickly adapt to future conditions as they arise, the Area of Potential Effect (APE) for the proposed action is the entire 26-acre North Mount area (Figure 2).
4. The proposed action includes relocation and construction of mock buildings constructed of sea-land-container connex boxes and large, stacked concrete blocks (Figure 3). To clear the land for the placement of these buildings and upkeep the "roads" and alleyways," periodic mechanical disking of the surface soil is required. The disking, both for initial construction and for periodic upkeep, will disturb the soil to a maximum depth of approximately 8 inches (20 cm) (Figures 4 and 5).

5. The entire APE has been subjected to a Phase I Cultural Resources Assessment Survey in 2004. The resulting report of investigations was found complete and sufficient by your office on 4 January, 2006 (DHR 2005-11605). No cultural resources were encountered within the APE. According to the currently approved archaeological probability model, the APE is designated as having a medium probability of containing cultural resources.

6. Due to the lack of historic resources in the APE, it is the determination of the US Air Force that this action will have no effect on any historic properties eligible for listing in the National Register of Historic Places.

7. If you have any questions, please contact Ron Grayson at (863) 452-4119, ext 306, or by electronic mail at ronald.grayson@avonpark.mcdill.af.mil.



JOHN B. PECHINEY, Lt Col, USAF
Commander

Attachments:

1. Project Location: 30E, 32S, 011; USGS Quad. map, Lake Arbuckle NE, 1997 (Figure 1.)
2. Area of Potential Effect (APE) (Figure 2.)
3. Pictures of mock building, disked area, and equipment (Figures 3 thru 5)



FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Lt Col John B. Pechiney
Department of the Air Force
Detachment 1, 23 WG/CC
29 South Boulevard
Avon Park Air Force Range, Florida 33825-9381

October 31, 2007

RE: DHR Project File Number: 2007-7773
Received by DHR October 10, 2007
Improvements to North Mount Training Complex
Avon Park Air Force Range, Polk County

Dear Colonel Pechiney:

Our office reviewed the referenced project for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*, or otherwise of historical, architectural or archaeological significance. The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties* and the implementing state regulations.

Based on the information provided, this office concurs that no historic properties will be affected by this undertaking.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail sedwards@dos.state.fl.us, or at 850-245-6333 or 800-847-7278.

Sincerely,

Frederick P. Gaske, Director, and
State Historic Preservation Officer

500 S. Bronough Street • Tallahassee, FL 32399-0250 • <http://www.flheritage.com>

<input type="checkbox"/> Director's Office (850) 245-6300 • FAX: 245-6436	<input type="checkbox"/> Archaeological Research (850) 245-6444 • FAX: 245-6452	<input checked="" type="checkbox"/> Historic Preservation (850) 245-6333 • FAX: 245-6437	<input type="checkbox"/> Historical Museums (850) 245-6400 • FAX: 245-6433
<input type="checkbox"/> Southeast Regional Office (561) 416-2115 • FAX: 416-2149	<input type="checkbox"/> Northeast Regional Office (904) 825-5045 • FAX: 825-5044	<input type="checkbox"/> Central Florida Regional Office (813) 272-3843 • FAX: 272-2340	



DEPARTMENT OF THE AIR FORCE
DETACHMENT 1, 23RD WING
AVON PARK AIR-GROUND TRAINING COMPLEX
MACDILL AIR FORCE BASE, FLORIDA, AND AVON PARK AIR FORCE RANGE, FLORIDA

2 October 2007

MEMORANDUM FOR MICCOSUKEE BUSINESS COMMITTEE
ATTN MR. STEVE TERRY
NAGPRA & Section 106 Representative
PO Box 440021 – Tamiami Station
Miami, FL 33144-0021

FROM: DET 1, 23 WG/CC
29 South Boulevard
Avon Park Air Force Range, FL 33825-9381

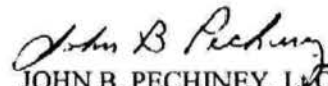
SUBJECT: Improvements to North Mount Training Complex

1. In accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and *36 CFR Part 800: Protection of Historic Properties*, this letter is to request your input on the proposed improvements to a mock urban village in the North Mount area of Foxtrot Range on Avon Park Air Force Range (APAFR). These improvements are needed to create a more realistic and effective training environment for service members utilizing the range. The North Mount area is located at TRS: 30E, 32S, 011 (Figure 1).
2. Various regional conflicts require a restructuring of the training facilities on APAFR to better simulate conditions that US personnel will encounter. To accomplish this goal, APAFR must redesign and rebuild its current North Mount Training Complex from an Eastern European (Cold War) setting to one more fitting the regions where troops are deployed.
3. To allow for a flexible training environment and the ability for APAFR to quickly adapt to future conditions as they arise, the Area of Potential Effect (APE) for the proposed action is the entire 26-acre North Mount Area (Figure 2).
4. The proposed action includes relocation and construction of mock buildings constructed of sea-land-container connex boxes and large, stacked concrete blocks (Figure 3). To clear the land for the placement of these buildings and upkeep the "roads" and alleyways," periodic mechanical disking of the surface soil is required. The disking, both for initial construction and for periodic upkeep, will disturb the soil to a maximum depth of approximately 8 inches (20 cm) (Figures 4 and 5).

5. The entire APE has been subjected to a Phase I Cultural Resources Assessment survey in 2004. This testing included a thorough pedestrian inspection and subsurface testing in all areas. No cultural resources were encountered within the APE.

6. Due to the lack of historic resources in the APE, it is the determination of the US Air Force that this action will have no effect on any historic properties eligible for listing in the National Register of Historic Places.

7. Please respond to the letter within thirty (30) days, indicating whether you wish to provide input on this action. If you do not respond or request an extension of time to review the proposed action and the effects it may have on tribal cultural issues, the USAF will move forward with the next phase of the project. If you have any questions, please contact Ron Grayson at (863) 452-4119, ext 306, or by electronic mail at ronald.grayson@avonpark.macdill.af.mil.


JOHN B. PECHINEY, Lt Col, USAF
Commander

Attachments:

1. Project Location: 30E, 32S, 011; USGS Quad. map, Lake Arbuckle NE, 1997 (Figure 1.)
2. Area of Potential Effect (APE) (Figure 2.)
3. Pictures of mock building, disked area, and equipment (Figures 3 thru 5)

Grayson Ronald Contr 23 WG DET 1 OL A/CEVN

From: Steve Terry [SteveT@miccosukeetribe.com]
Sent: Friday, October 12, 2007 3:28 PM
To: ronald.grayson@avonpark.macdill.af.mil
Subject: Improvements to North Mount Training Complex

The Miccosukee Tribe of Indians of Florida has reviewed this notification and attachments. After consultation with Mr. Dayhoff and careful review of the documentation provided, the Tribe determined that there is no cultural, historical, or religious site of the Tribe at this location. This determination was based on the documentation provided by Department of the Air Force.

Thank you for consulting with us. Please call me at (305) 223-8380, Ext. 2244, if you require further information.

Steve Terry
NAGPRA & Section 106 Representative
Miccosukee Tribe
P.O. Box 440021
Miami, FL 33144-0021
(305) 223-8380, Ext. 2243
(305) 223-8380, Ext. 2243
Stevet@miccosukeetribe.com

Grayson Ronald Contr 23 WG DET 1 OL A/CEVN

From: HPO [HPO@seminolenation.com]
Sent: Tuesday, October 09, 2007 4:28 PM
To: ronald.grayson@avonpark.macdill.af.mil
Subject: North Mount Training Complex.

RE: Improvements to North Rock Mount Training Complex.

Mr. Grayson,

Feel free to proceed with these improvements. However, if any human remains, funerary objects or other associated objects dating from the 1720's to the 1850's are uncovered, please contact me immediately.

Thank you.

Pare Bowlegs

Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, Ok. 74884
Hwy. 270 & 56
1-405-257-7292 Office
1-405-257-7209 FAX
www.seminolenation.com



DEPARTMENT OF THE AIR FORCE
DETACHMENT 1, 23RD WING
AVON PARK AIR-GROUND TRAINING COMPLEX
MACDILL AIR FORCE BASE, FLORIDA, AND AVON PARK AIR FORCE RANGE, FLORIDA

7 May 2008

MEMORANDUM FOR Mr. Paul Souza
U.S. Fish and Wildlife Service
South Florida Field Office
1339 20th St.
Vero Beach FL 32960-3559



FROM: DET 1, 23 WG/CC
29 South Boulevard
Avon Park Air Force Range FL 33825-9381

SUBJECT: Section 7 Reinitiation of Consultation

1. The Air Force (AF), at Avon Park Air Force Range, (APAFR) proposes to upgrade two existing military operations in urban terrain (MOUT) targets, also known as urban villages (Attachment 1). Past consultation for the MOUTs include United State Fish and Wildlife Service (USFWS) Log Number 4-1-05-PL-10979 and 4-1-01-I-332. For both service logs, a determination and of "is not likely to adversely affect" the Florida scrub-jay (FSJ) (*Aphelocoma coerulescens*), Florida grasshopper sparrow (FGS) (*Ammodramus savannarum floridanus*), and red cockaded woodpecker (RCW) (*Picoides borealis*) was determined.
2. The upgrades would primarily increase the intensity of ground disturbance required for establishing buildings and establish roads over what was originally consulted. Added to one MOUT would be new roads, roadside drainage swales, culverts, and detention ponds. Added to another MOUT would be continuous disking in order to fill ordnance craters and maintain an urban appearance. The need for these upgrades is safety, realism, and erosion control. For safety, disking to bare mineral soil over the project site is require to safely establish large concrete block buildings (blocks dimensions typically being six foot by two foot by three foot) that personnel can train in and on. For realism, new, multiple roads would allow vehicle convoys and assaults to access multiple areas of one MOUT as opposed limited roads that opposition forces would preposition improvised explosive devices (IEDs) and defensive personnel positions with small arms fire and rocket propelled grenades. For erosion control, it is acknowledged that high density buildings with new roads would increase stormwater runoff so the establishment and maintenance of drainage swales and detention ponds would mitigate soil erosion. The proposed actions for the two MOUTs are described in detail.
3. The MOUT in the North Tactical Range (formally Foxtrot Range) was initially established in 2001 proceeding consultation (Service Log Number 4-1-01-I-332) in 2000. It limited ground disturbance to where the buildings would be placed. Later, in 2005, the MOUT was expanded, with consultation (Service Log Number 4-1-05-PL-10979), to 26 acres and allowed existing buildings to be moved and new buildings added. The new buildings included concrete block buildings that personnel could train in and on. The proposed action in this current consultation would continue to build new buildings anywhere within the 26 acres, but would allow disking to mineral soil of the project site as the MOUT would be expanded. Approximately one acre of the MOUT would be urbanized in 2008 or later (see Attachment 2). Also, two elevated roads totaling approximately 365 meters long and five meters wide

with clay/shell would be added. To mitigate for stormwater runoff, four culverts would be added, 570 meters of roadside swales along the roads added, and a one acre detention pond would be built within the 26 acres (see Attachment 3). The pond would be 50 centimeters deep with no berms. Standing water is undesirable for military training, so the detention pond would have a porous fiber mat lining it with crushed tile or brick to a depth of 30 centimeters. The MOUT is projected to grow for the next twenty years and could be urbanized for the full 26 acres with buildings, roads, road swales, and detention ponds. If fully developed, three additional acres of one or more ponds would be required with the ponds being located within, adjacent, or near the 26 acre designation. Maintenance would include mowing a five meter buffer around each building, road grading, and replacing ordnance hit buildings twice a year. Maintenance could occur any time of the year, but January and February are favored maintenance months.

4. The MOUT in the South Tactical Range (formally Echo Range) was initially established in 2001 under the same consultation. The proposed action would disk to mineral soil approximately eight acres within the MOUT one or two times annually (Attachment 4).

5. A number of actions have occurred in both MOUTs that were outside of the previous proposed actions and previous consultations. They were:

- a) Approximately five acres were disked to mineral soil in the North Tactical Range MOUT just prior to construction of new buildings in February 2005. This area is recovering with native vegetation – primarily early seral plants.
- b) During training, vehicles have departed existing roads and have left vehicle trails within the North Tactical Range MOUT.
- c) Portions of the North Tactical Range MOUT have been mowed at various times.
- d) In the South Tactical Range MOUT four buildings have been removed, while 17 have been added.
- e) Eight acres in the South Tactical Range were disked to mineral soil during the winter of 2007 and 2008. The area is marginally recovering with native plants.

6. Of the three listed threatened or endangered birds in the two previous consultations, only RCW habitat (pine flatwood plant community) was identified for the North Tactical Range MOUT and FGS habitat (dry prairie plant community) for the South Tactical MOUT habitat. RCW habitat was considered marginal foraging habitat and constituted 0.3 percent of total foraging locations. FGS habitat was considered only as foraging habitat since nest territories were over 615 meters distant. Current values of these habitat locations were determined to have not changed.

7. More recent attention has been given to the federally listed threatened, Eastern indigo snake. The snake has a broad habitat and is considered to occupy both MOUT locations, but more so for the North Tactical Range MOUT. This is due to the presence of the gopher tortoise and its respective burrows within the MOUT designation. The indigo snake can occupy abandoned tortoise burrows. A survey of 1.5 acres for the proposed action on 11 October 2007 resulted in three active and three inactive gopher tortoise burrows (see Attachment 5). While this habitat is classified vegetatively as pine flatwoods, ordnance induced wildfires burn this area annually resulting very few trees, stunted shrub growth, and

diverse forb and grass species. This diversity of flora at low height (generally two feet or lower) is viewed as creating good burrow and foraging habitat for the gopher tortoise and consequently making good resident habitat for the indigo snake. Another survey conducted on 19 September 2007 at approximately 850 meters to the south and east of the MOUT in similar flatwoods resulted in 17 burrows on 5.6 acres - seven burrows being active, 11 inactive (Attachment 6). This survey was conducted in preparation for consultation (Service Log Number 41420-2008-I-0015).

8. Direct effects of proposed North Tactical Range MOUT by developing the one acre proposal and long term potential development of 25 acres and respective detention ponds are determined as "no effect" for the RCW due to initial marginal foraging habitat and small size of impact when considering the overall habitat area. For the indigo snake, a "may affect, not likely to adversely affect" is determined because some of the gopher tortoise burrows, both active and inactive, would be collapsed. Tortoise burrows, which cannot be avoided, would be excavated and gopher tortoises would be removed and relocated. Indigo snakes, if encountered, would be allowed to move away on their own. Indigo snake and gopher tortoise habitat are not quantified at APAFR, but the acreage is known to be large. The loss of 25 acres plus detention ponds is considered small for the overall habitat area - the installation is 106,000 acres in size.

9. Direct effects of continuous disking the eight acres of the South Tactical Range MOUT is determined as "may effect, not likely to adversely affect" due to the small size of acreage impacted. Eight acres of dry prairie habitat having forage value for the FGS would be lost. 11,628 acres of FGS habitat exists at APAFR (USAF 2000), of which 7,399 acres is found in the South Tactical Range. With eight acres lost, a 0.11 percent would result for the South Tactical Range. It is worth noting that FGS population has dramatically declined from a peak of 298 individuals in 1997 to 14 individuals in 2006. Most of the remaining population is in the South Tactical Range, so the habitat in this location is important for recovery.

10. An indirect effect for both MOUTs is the potential for noxious weeds to spread. Both MOUTs are trained in frequently with vehicle access. Given the disturbance nature of development, training, and maintenance, the potential for exotic, invasive weeds is likely, especially cogon grass (*Imperata cylindrical*). The main concern is that if exotic, invasive weeds establish at the MOUTs, the MOUTs would become vectors for vehicle transport of invasive weed seed to other parts of the installation to include threatened and endangered species habitat.


11. Cumulative effects include a mock railway that will be established approximately 850 meters from the North Tactical Range MOUT. This railway will serve as a land feature only and will not receive the intensive, long term maintenance activities and expansions as the MOUT. Still, there will be initial ground disturbing activities near gopher tortoise burrows with the potential for invasive weeds to establish.

12. Conservation measures for threatened and endangered species include the following:

- a) All personnel involved with the construction of the target will receive training on protection measures for the indigo snake. Training will include 1). a description of the eastern indigo snake, its habits, and protection under Federal Law; 2). instructions not to injure, harm, harass or kill this species; 3). directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and, 4). telephone numbers of Air Force personnel to be contacted if a dead eastern indigo snake is encountered.

- b) An eastern indigo snake monitoring report will be submitted within 60 days of the conclusion of clearing phases. The report will be submitted whether or not eastern indigo snakes are observed.
- c) Burrows which cannot be avoided will be excavated and any gopher tortoise encountered will be re-located. Indigo snakes encountered will be allowed to leave on their own.
- d) Exotic, invasive weeds will be chemically treated for eradication if discovered in the MOUTs.

13. We request your concurrence with our informal consultation determination under Section 7 of the Endangered Species Act. If you have questions, please contact Mr. Paul Ebersbach at (863) 452-4119, ext 301.


JOHN B. PECHINEY, Lt Col, USAF
Commander

Atchs 8

- 1. Location Maps (4):
- 2. Survey Results (2)
- 3. Sparrow Map
- 4. Literature Cited/Preparer

cc:
USFWS/Mark Fredlake



United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960



May 21, 2008

Lieutenant Colonel John B. Pechiney
Department of the Air Force
23 WG, DET 1/CC
Avon Park Air/Ground Training Complex (ACC)
Avon Park Air Force Range, Florida 33825-9381

Service Consultation Code: 41420-2008-I-0380
Federal Activity Code: 41220-2008-FA-0633
Applicant: United States Air Force
Dated Received: May 12, 2008
Counties: Highlands/Polk

Dear Colonel Pechiney:

The U.S. Fish and Wildlife Service (Service) has reviewed the information presented in your correspondence and attachments dated May 7, 2008, regarding the proposed upgrade of two military operations urban terrain (MOUT) targets on Avon Park Air Force Range (APAFR) (Figure 1). The Air Force has previously consulted with the Service regarding the effects of the MOUT targets on Florida scrub-jay (FSJ) (*Aphelocoma coerulescens*), Florida grasshopper sparrow (FGS) (*Ammodramus savannarum floridanus*), and red cockaded woodpecker (RCW) (*Picoides borealis*). You have determined, in your reinitiation memo, that the proposed upgrade may affect but will not adversely affect FSJ, RCW, and FGS. You have also determined that the proposed upgrade activity may affect but is not likely to adversely affect eastern indigo snake (*Drymarchon corais couperi*).

This letter represents the Service's views on the effects of the proposed action in accordance with the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 *et seq.*). The Service understands that:

The MOUT in the North Tactical Range (formally Foxtrot Range) was initially established in 2001 following consultation with the Service in 2000 (Log Number 4-1-01-I-332). Ground disturbance was limited to where the buildings would be placed. Later, after consultation with the Service in 2005 (Log Number 4-1-05-PL-10979), the MOUT was expanded to 26 acres, existing buildings were moved and new buildings were added.

The Air Force, at the Avon Park Air Force Range (APAFR), proposes upgrading the MOUT target at the North Tactical Range (Figure 2) by adding additional roads and simulated buildings to create a more realistic urban training environment. The new buildings will include concrete



block buildings that personnel could train in and on. Under this proposed action the Air Force would continue to build new buildings anywhere within the 26 acres, and would disk, to mineral soil, around the buildings sites as the North MOUT is expanded. Disking is required to level the ground for safe installation and stabilization of block buildings and maintain vegetation around the buildings to better simulate an urban environment. The new roads will allow convoys to avoid off-road travel.

Approximately one acre of the North MOUT would be urbanized in 2008 or later (Figure 2) and two elevated roads; totaling approximately 365 meters long and five meters wide with a clay/shell cap; would be added. Four culverts would be added, 570 meters of roadside swales along the roads added, and a one-acre detention pond would be built, to reduce stormwater runoff, within the 26 acres (Figure 3). The pond would be 50 centimeters deep with no berms. Standing water is undesirable for military training, so the pond will be lined with a porous fiber mat and filled with crushed tile or brick to a depth of 30 centimeters.

The North MOUT is projected to grow for the next twenty years and the entire 26 acres could be urbanized with buildings, roads, road swales, and detention ponds. If fully developed, three additional acres of one or more ponds would be required to be located within, adjacent, or near the 26-acre designation. Maintenance would occur twice per year and would include mowing a five-meter buffer around each building, road grading, and replacing damaged buildings. Maintenance could occur any time of the year, but January and February are favored maintenance months.

The MOUT in the South Tactical Range (formally Echo Range) was initially established in 2001 after consultation with the Service (Log Number 4-1-01-I-332). The current proposal is to disk to mineral soil approximately eight acres within the South MOUT one or two times annually (Figure 4).

In addition a number of actions have occurred in both MOUTs that were outside of the previous proposed actions and previous consultations. They were:

- a) Approximately five acres were disked to mineral soil in the North Tactical Range MOUT just prior to construction of new buildings in February 2005. This area is recovering with native vegetation – primarily early seral plants.
- b) During training, vehicles have departed existing roads and have left vehicle trails within the North Tactical Range MOUT.
- c) Portions of the North Tactical Range MOUT have been mowed at various times.
- d) In the South Tactical Range MOUT four buildings have been removed, while 17 have been added.

- e) Eight acres in the South Tactical Range were disked to mineral soil during the winter of 2007 and 2008. The area is marginally recovering with native plants.

Air Force and Service personnel conducted a gopher tortoise (*Gopherus Polyphemus*) burrow survey on a portion of the North MOUT on October 11, 2007. The results of the survey indicate that eastern indigo snake (*Drymarchon corais couperi*) could potentially occupy the site. The Service understands that the South MOUT site has a relatively high water table and does not support gopher tortoise.

The Air Force agrees to the following conservation measures:

1. All ground personnel involved with the construction, maintenance, and use of the MOUT targets will receive training on protection measures for the indigo snake. Training will include: a) a description of the eastern indigo snake, its habits, and protection under Federal Law; b) instructions not to injure, harm, harass or kill this species; c) directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and, d) telephone numbers of Air Force personnel to be contacted if a dead eastern indigo snake is encountered.
2. An eastern indigo snake monitoring report will be submitted within 60 days of the conclusion of clearing phases. The report will be submitted whether or not eastern indigo snakes are observed.
3. Pre-construction surveys for gopher tortoise burrows will be conducted, as needed, in areas scheduled for MOUT expansion. Burrows which cannot be avoided will be excavated and any gopher tortoise encountered will be re-located. Indigo snakes encountered will be allowed to leave on their own.
4. Exotic, invasive weeds will be chemically treated for eradication if discovered in the MOUTs.

The Service concurs that the proposed project may affect, but is not likely to adversely affect FSJ, RCW, FGS, and eastern indigo snake. Conditions in and around the MOUT targets for RCW, FSJ, and FGS have not changed since the consultation of February 25, 2005 (Service log No. 4-1-05-PL-10970). The proposed action, including implementation of the conservation measures, does not reach the level where take is likely to occur. The five actions which occurred within the MOUT targets between 2005 and 2008 were not of sufficient scope and duration to adversely affect RCW, FSJ, FGS, or eastern indigo snake. The Service bases our concurrence on the best available information, specifically your gopher tortoise survey results of October 11, 2007, the South Florida Multi-Species Recovery Plan (Service, 1999), and conversations and correspondence with project proponents.

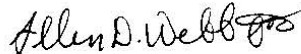
Lieutenant Colonel John B. Pechiney

Page 4

This letter fulfills the requirements of the ESA and no further action is required. If modifications are made to the proposed action or, if additional information involving potential effects to listed species becomes available, please notify our office.

The Service appreciates your past monitoring and conservation efforts for listed species on Avon Park Air Force Range (APAFR). Your continued conservation management is vital to maintaining RCW, FSJ, FGS, eastern indigo snake and other listed species. If you have any questions regarding this project, please contact Mark Fredlake at 863-452-4164.

Sincerely yours,



Paul Souza
Field Supervisor
South Florida Ecological Services Office

cc:
APAFR, Avon Park, Florida (Paul Ebersbach)

LITERATURE CITED

U.S. Fish and Wildlife Service. 1999. South Florida Multi-Species Recovery Plan. U.S. Fish and Wildlife Service; Atlanta, Georgia.

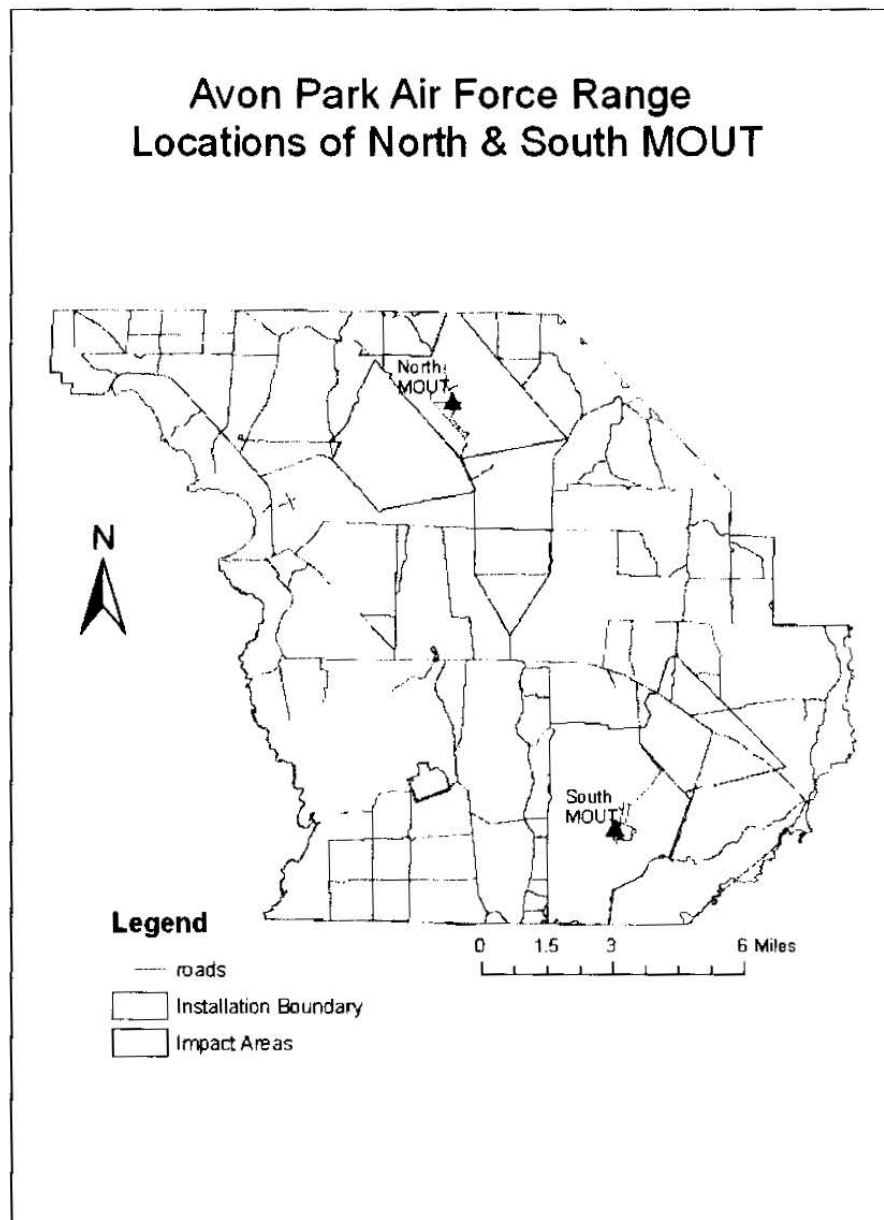


Figure 1. Locations of the military operations urban terrain (MOUT) targets in the North and South Tactical Ranges.

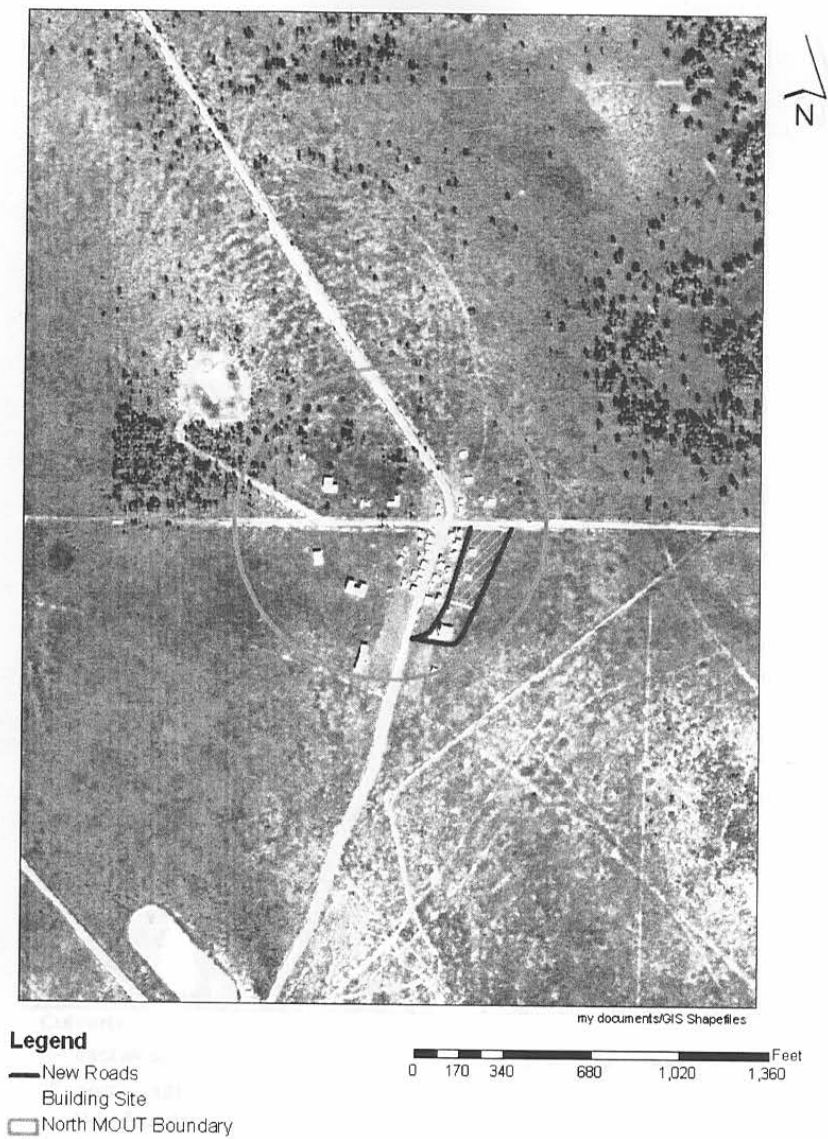


Figure 2. Aerial view of MOUT in North Tactical Range. New roads and building site for 2008 are shown.



Figure 3. Aerial view of North MOUT showing locations of new roads, swales, culverts, and detention pond.



Figure 4. Aerial view of the MOUT target in the South Tactical Range. The area within the red boundary will be disked once or twice per year.



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

June 20, 2008

Mr. Tod P. Zechiel, NEPA Coordinator
OL A, DET 1, 23 WG/CEVN
29 South Boulevard
Avon Park AFR, FL 33825-9381

RE: Department of the Air Force – Draft Environmental Assessment for Upgrading the
Military Operations Urban Terrain (MOUT) Target Arrays at Avon Park Air Force
Range – Polk and Highlands Counties, Florida.
SAI # FL200805134224C

Dear Mr. Zechiel:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the draft environmental assessment (EA).

Although the Proposed Action would occur within Florida grasshopper sparrow habitat, the Florida Fish and Wildlife Conservation Commission (FWC) notes that it is likely to have a negligible impact on the sparrow's population. The EA should include data on the distribution of sparrows on Echo Range based on point counts from 2004-2008 and address the scarcity of point count data from the vicinity of the mock runway and South MOUT. Staff also recommends that all gopher tortoise burrows impacted by the Proposed Action be inspected to ensure that eastern indigo snakes are not present during construction activities. Equipment operators engaged in mowing and disking at the North MOUT should be informed of the potential presence of eastern indigo snakes and instructed to avoid direct impacts. Please refer to the enclosed FWC letter for additional comments and recommendations.

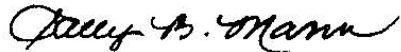
Based on the information contained in the draft EA and the enclosed state agency comments, the state has determined that, at this stage, the subject project is consistent with the Florida Coastal Management Program (FCMP). The federal agency must, however, address the concerns identified by our reviewing agencies prior to project implementation. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent reviews. The

Mr. Tod P. Zechiel
June 20, 2008
Page 2 of 2

state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting stage.

Thank you for the opportunity to review the proposed project. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,



Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

cc: Mary Ann Poole, FWC



Florida

Department of Environmental Protection

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Project Information	
Project:	FL200805134224C
Comments Due:	06/18/2008
Letter Due:	06/27/2008
Description:	DEPARTMENT OF THE AIR FORCE - DRAFT ENVIRONMENTAL ASSESSMENT FOR UPGRADING THE MILITARY OPERATIONS URBAN TERRAIN (MOUT) TARGET ARRAYS AT AVON PARK AIR FORCE RANGE - POLK AND HIGHLANDS COUNTIES, FLORIDA.
Keywords:	USAF - MOUT TARGET ARRAYS AT AVON PARK AIR FORCE RANGE - POLK AND HIGHLANDS CO.
CFDA #:	12.200
Agency Comments:	
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION	
Although the Proposed Action would occur within Florida grasshopper sparrow habitat, it is likely to have a negligible impact on the sparrow's population. The EA should include data on the distribution of sparrows on Echo Range based on point counts from 2004-2008 and address the scarcity of point count data from the vicinity of the mock runway and South MOUT. Staff also recommends that all gopher tortoise burrows impacted by the Proposed Action be inspected to ensure that eastern indigo snakes are not present during construction activities. Equipment operators engaged in mowing and disking at the North MOUT should be informed of the potential presence of eastern indigo snakes and instructed to avoid direct impacts.	
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION	
No Comment	
SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT	
Released Without Comment	

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

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June 16, 2008

Ms. Lauren Milligan, Clearinghouse Coordinator
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, FL 32399-3000

Re: Polk and Highlands Counties, SAI #FL200805134224C, Department of the Air
Force – Draft Environmental Assessment for Upgrading the Military Operations
Urban Terrain (MOUT) Target Arrays, Avon Park Air Force Range

Dear Ms. Milligan:

The Division of Habitat and Species Conservation, Terrestrial Habitat Conservation and
Restoration Section, of the Florida Fish and Wildlife Conservation Commission has
coordinated agency review of the Department of the Air Force Draft Environmental
Assessment (EA) for Upgrading the Military Operations Urban Terrain (MOUT) Target
Arrays at Avon Park Air Force Range (APAFR), Florida, and provides the following
comments and recommendations in accordance with the Coastal Zone Management
Act/Florida Coastal Management Program and the National Environmental Policy Act
(NEPA).

RECEIVED

JUN 19 2008

Project Description

OIP/OLGA

The Proposed Action is to upgrade two MOUT target arrays, or urban villages, at
APAFR. These facilities are used to train aircrews, artillery crews, and ground-based air-
controller teams. The upgrades are necessary to allow the safe construction of mock
buildings, provide additional vehicular access, and create a more realistic urban setting.

The North MOUT upgrade would involve intensive site preparation by clearing the
construction site to bare mineral soil, constructing new buildings, new roads, and a
stormwater drainage system. After construction, the area would revegetate naturally near
the new buildings and roads, and it would be mowed once or twice annually. Twenty-six
acres over the next 20 years could be urbanized in this manner. Construction would
begin as early as 2008. The South MOUT, which encompasses approximately eight
acres, would be disked once or twice annually. No additional roads or buildings would
be added. The draft EA includes a Finding of No Significant Impact, as the Proposed
Action does not constitute "a major Federal action significantly affecting the quality of
the human environment" when considered individually or cumulatively in the context of
NEPA. In addition, APAFR will initiate an informal Section 7 consultation with the U.S.
Fish and Wildlife Service with a determination of "may affect, but not likely to adversely
affect" the eastern indigo snake and Florida grasshopper sparrow (FGS). The results of
this consultation will be presented in the final EA.

Concerns and Recommendations

Florida Grasshopper Sparrow

The FGS is an endangered subspecies endemic to the south-central prairie region of the state, and breeding populations are known from only seven locations. The Proposed Action would occur within FGS habitat but is likely to have a negligible impact on the FGS population. Improvements to the South MOUT on Echo Range are limited to disking around existing structures, and upgrades to the North MOUT are outside the historic distribution of the FGS on Bravo/Foxtrot Range.

The map on the past page (unnumbered; page 80 of 80) of the draft EA shows FGS locations ≥ 300 meters from the South MOUT, but occurrence data are limited to point counts from 1996 to 2003 and nest locations from 2005. Also, the array of point count stations on Echo Range omits a large area around the mock runway and the South MOUT, and some FGS are probably not detected during point counts. We recommend that the EA include data on the distribution of FGS on Echo Range based on point counts from 2004 to 2008, as well as address the apparent paucity of point count data from the vicinity of the mock runway and South MOUT.

Eastern Indigo Snake

The eastern indigo snake is a wide-ranging, threatened species that likely occurs in a variety of habitats at APAFR. The presence of gopher tortoise burrows associated with the North MOUT is a strong indication of potential eastern indigo snake occurrence; however, the acreage of habitat lost due to the Proposed Action would not be significant due to the large home range of the species. We recommend that all gopher tortoise burrows impacted by the Proposed Action be inspected with a burrow camera to ensure that eastern indigo snakes are not present during construction activities. We further suggest that equipment operators engaged in the mowing and disking at the North MOUT are informed of the potential presence of eastern indigo snakes and are instructed to avoid direct impacts to the species.

Summary

The draft Environmental Assessment is determined to be consistent with our authorities (Chapters 370 and 372, Florida Statutes) under the Florida Coastal Management Program. The Proposed Action, as detailed in the draft EA, is not expected to significantly impact state-listed species. However, the current population status of the FGS warrants that close monitoring of this species and its habitat be conducted in the vicinity of the South MOUT to insure the continued existence of the FGS at APAFR. If you or your staff would like to coordinate further on the recommendations contained in this report, please contact me at 850-410-5272, or email me at maryann.poole@MyFWC.com, and I will be glad to help make the necessary arrangements. If your staff has any specific questions regarding our comments, I

Ms. Lauren Milligan
Page 3
June 16, 2008

encourage them to contact Shane Belson at our office in Kissimmee by phone at (407)846-5191 or by email at shane.belson@MyFWC.com).

Sincerely,



Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/sb
ENV 1-3-2
MOUT_Avon Park_1496

SECTION 9.0 RECORD OF RESPONSES TO COMMENTS ON DRAFT EA

COMMENTS	COMMENT	AIR FORCE RESPONSE
Seminole Nation in of Oklahoma	1. Concurred with Proposed Action, but requested coordination if human remains or funerary objects found.	1. Concurred with request, added text addressing human remains and funerary objects in Section 4.13.
Florida State Clearinghouse	1. Requested a map showing the location of the North and South MOUTs on the installation.	1. Concurred with request, added a map as Figure 1.2-1 showing MOUT locations.
Florida Fish and Wildlife Conservation Commission	<p>1. Requested additional FGS distribution data from 2004 to 2008.</p> <p>2. Requested an explanation as to why FGS point counts/listening posts were omitted from the South MOUT area and mock airfield.</p> <p>3. Recommended that equipment operators be trained in identifying and avoidance of indigo snakes.</p> <p>4. Recommended that APAFR use an underground cable scope with monitor to inspect gopher tortoise burrows for indigo snakes for those burrows that cannot avoid impact due to construction and maintenance for the North MOUT.</p>	<p>1. Concurred with request. Added a map as Figure 3.10-1 showing FGS distribution from 1997 through 2007 and a map as Figure 3.10-2 showing distribution of FGS in 2008.</p> <p>2. Concurred with request. Added text in Section 3.10 explaining how FGS surveys were conducted and justification for not surveying the South MOUT and mock airfield. Added a map as Figure 3.10-3 showing FGS point counts/listening posts.</p> <p>3. Concurred with recommendation, added text addressing indigo snake recognition and avoidance in Section 4.10.</p> <p>4. APAFR would consider, but not necessarily commit to, using a cable scope and monitor to inspect gopher tortoise burrows that could not be avoided during MOUT maintenance and construction. Justification being that cable scopes can be limited by sharp turns and roots in a burrow and that excavation is a more certain method of burrow examination. However, a cable scope may be used to assist in</p>

		<p>burrow excavation. Burrows would not be excavated if indigo snakes were found with the cable scope. Construction and maintenance activities involving the burrow would not begin until the indigo snake left the burrow.</p>
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APPENDIX A: CALCULATION OF DEVELOPMENT OF THE NORTH MOUT

Calculations for the area of North MOUT currently developed

The existing acreage of development for the North MOUT includes the physical displacement BY the buildings plus a 15 foot offset around each building required for building maintenance as well as the acreage occupied by existing roads.

The average area of existing buildings is 870 square feet. The offset is 1,800 square feet. Therefore, the total square footage with offset per building is 2,670 square feet. There are currently 43 buildings, so the total square footage of existing building development is 114,810 square feet or 2.66 acres.

Existing roads in the North MOUT have the dimensions of 2,800 linear feet by 16 feet wide for a total of 44,800 square feet or one acre.

The total acres of development is 3.66 acres. The North MOUT is 26 acres, so the percent of the North MOUT that is developed is 14 percent.

APPENDIX B: APAFR HAZARD SEVERITY MODEL

Estimating Hazard Severity (HS)

Category	Title	Weight	Description
I.	Catastrophic	(4)	May cause death or multiple injuries to people or loss of or extensive damage to <u>high value</u> property or loss of system.
II.	Critical	(3)	May cause severe injury, severe occupational illness or <u>major value property damage</u> and/or mission degradation.
III.	Marginal (Moderate)	(2)	May cause minor injury or minor occupational illness resulting in lost workday(s) and/or <u>marginal value property damage</u> and/or minor property damage.
IV.	Negligible	(1)	Probably will not affect personnel safety or health and result in less than significant damage.

Estimating Risk Probability (RP)

Category	Weight	Description
(AFP 91-215)		
Frequent	1.00	- Constantly occurs
Likely	.75	- High Frequency of occurrence
Occasional	.25	- Medium frequency of occurrence
Seldom/ Unlikely	.05	- Low frequency of occurrence

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Exposure (E)

<u>People Exposure</u>	<i>or</i>	<u>Property Exposure</u>	<u>Weight</u>
10 or more people exposed		High Value	(4)
5-9 people exposed		Major Value	(3)
1-4 people exposed		Marginal Value	(2)
0 people exposed		Low Value	(1)

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Danger Value Calculations

Exposure Level 1				
RP	HS			
	1	2	3	4
1	6.250	12.500	18.750	25.000
0.75	4.688	9.375	14.063	18.750
0.25	1.563	3.125	4.688	6.250
0.05	0.313	0.625	0.938	1.250

Exposure Level 2				
RP	HS			
	1	2	3	4
1	12.50	25.00	37.50	50.00
0.75	9.38	18.75	28.13	37.50
0.25	3.13	6.25	9.38	12.50
0.05	0.63	1.25	1.88	2.50

Exposure Level 3				
RP	HS			
	1	2	3	4
1	18.75	37.50	56.25	75.00
0.75	14.06	28.13	42.19	56.25
0.25	4.69	9.38	14.06	18.75
0.05	0.94	1.88	2.81	3.75

Exposure Level 4				
RP	HS			
	1	2	3	4
1	25.00	50.00	75.00	100.00
0.75	18.75	37.50	56.25	75.00
0.25	6.25	12.50	18.75	25.00
0.05	1.25	2.50	3.75	5.00

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Danger Index

(DI)

(DV)

1 Immediate Action

75-100

(Highest Importance)

2 High Priority

50-74

(Considerable Importance)

3 Moderate Priority

25-49

4 Low Priority

0-24

(Relatively Low Importance)

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APPENDIX C: REPORT ON STORMWATER EROSION AND EROSION CALCULATIONS

Report on Storm Water Erosion

August 10, 2007

Paul F. Ebersbach
Chief, Environmental Flight
23d WG, Det 1 OL A/CEVC
29 South Boulevard
APAFR, Florida 33825-9381

Subject: Active Range Soil Conservatism Recommendations

Tt #: 05.0198.000

Dear Mr. Ebersbach:

Tetra Tech has conducted a review of active and inactive firing target at the Avon Park Air Force Range Complex, including the North and South Tactical, and North and South Conventional Ranges.

The individual targets and overall maintenance were observed with particular attention to soil conservatism and stabilization.

In general, targets not within disked areas have little to no stabilization concerns, these areas remain relatively unchanged and a vegetative protection (erosion control system) is sufficient to maintain soil conservatism.

Disked areas are broken into four categories.

Type I

First the high well drained areas, water is not collected and soil percolation is high and standing water is relatively short lived.

Type II

The second area is localized low area usually transporting drainage from or across the disked target area.

Type III

The third area is localized low areas where water collects and stands. The method of disking over time in these areas has constructed a sand curb or higher surrounding ambient soil. These areas do not cause significant runoff, or erosion problems.

Type IV

The last or fourth area of concern would be drainage pipes. Discharge at the exit point in the active range areas is unprotected end treatment and erosion protection for velocity/energy dissipation devices are ineffective or nonexistent. One area of significant erosion and velocity concerns is at the North Tactical area on the North side of the Airfield mockup. Drainage in this area has caused significant erosion and a delta of deposition is evident as the water discharges into the drainage ditches to the west.

This area shows explicit erosion activity on the North bank and is still unstable. The repose angle for dry sandy soil is normally 3:1. In general, the soil is standing at a vertical wall standing 3 to 4 feet in height. Energy flow runoff water has created erosion ditches in the North Bank. These ditches appear to be recent occurrences.

Action Items

The action plan proposed for these areas is subject to 3 conditions:

1. Cost vs. effectiveness of BMP
2. Accessibility of the facilities.
3. Current use and bombing activities.

BMPs

Type I

No new action required continued monitoring for loss of soil. When significant soil loss is identified by field crew of APAF staff should be reported to the Environmental Flight and the facility hydrologist in surrounding are utilize existing vegetation as discussed in Guidance Manual: Best Management Practices & NPDES Permitting (BMP) Erosion Control: 2 (EC 2).

Type II

Proposed active plan is to stabilize the transportation path of the water. Broken concrete and geotechnical fabric is recommended. A low water crossing/ford (Erosion Control 15) (BMP) outlines the recommended specification.

Collection the runoff in to side drainage swales is recommended to reduce the number of drainage crossing where possible drainage should be collected into existing pipe

connections. See type IV action plan.

In areas where low water crossings/fords are constructed, the broken concrete rubble should consist of 80% 8" to 12" diameter pieces and 75% 6" to 8" diameter and the remaining 5% less than 6" diameter. Rubble should extend 8" below the flow line and extend into the flow path to reduce energy from the cross current.

Low crossing areas should be lined with a geotechnical fabric to reduce the underlying soil loss. A non-woven fabric with sufficient thickness to prevent soil from traveling through the material. Well marked crossings are required to prevent future disking through rubble areas.

The APAFR maintenance department should yearly spray the area for weed removal if needed. An approved weed killer should be utilized giving surrounding vegetation and site condition. In no case should weed killers be applied to running or standing water.

Type III

In ponding areas where water stands periodically the erosion activity is minor. Where possible by use of side swales (vegetated), the maintenance crew can focus water to areas where there is positive discharge flow, where discharge occurs. An erosion armor should be constructed to:

- a) reduce flow energy
- b) minimize velocity and slope change
- c) insure receiving area is sufficient for any additional discharge

Areas with prolonged standing water will also promote vegetation growth. If possible, to re-construct the area to flow away from the bare soil (caused by disking) to prevent the standing water will be most effective. Selecting and armoring discharge points will allow for structured maintenance in these areas.

Where regarding is not practical, or possible, we should embrace the natural features. Allow water to be collected and select the best discharge point for the flow through. (Water influent that is greater than the capacity of the low lying area). This is normally the natural discharge location and can show signs of past erosion. To structure the discharge location, excavating (6" wide) a trench transverse to the flow. The trench should extend 3 times the flow area. Install a wooden weir structure with a lower weir and a higher weir (flow area).

Reinforce the weir with 2 x 4 or 4 x 4 supports driven into the ground $\frac{1}{2}$ the depth of the board support. Backfill the wall on both sides and armor (erosion mat or concrete rubble) to prevent further erosion.

Mark these areas well to prevent inadvertent destruction by disking activities.

Swales used to divert runoff should be constructed with the conservation of soil and erosion protection in mind. The BMP manual provides guidance to the development and maintenance of swales (EC #9).

Type IV

Suggested action in outlet areas is included in the Guidance Manual BMP & NPDES permitting. Structured protection of outlet pipes is lacking in general throughout the facility. We recommend that these areas be protected through continued replacement and a repair and replacement schedule should be created to be proactive rather than reactive to maintenance concerns.

An extensive location and classification process has been initiated by the facility environmental flight. The location and classification was conducted, and GPS points have been created for the pipes located at the range. Although all pipe connections were intended to be documented, there may be pipe located on the site were not found in the documentation stage.

Pipes with the highest volumes and currently in the worst condition should be regarded as the highest priority. Pipes that receive lower flow activity and are currently working should be given the lowest priority.

Pipes located in the active ranges should be protected from erosion, and BMP methods outlined should be installed as pipes are replaced. EC #10 and EC #14 provide guidance for installation.

The area of special concern (North and of North Tactical Airfield mockup) should be protected from further erosion activities. Several BMP methods should be considered. EC #11, EC #12, and EC #15 provide guidance for installation.

Slope drains should be considered at existing erosion ditches. The armoring of these areas will help to reduce further degradation of the area.

Gravel protection along steep slope areas with gravel bags will help reduce soil erosion from the running water velocity.

Check dams along the flow path will reduce the velocity and by armoring the step down locations, the further losses can be limited.

Where possible, restoration of soil losses should be considered excessive buildup in the delta area can be redistributed in areas of high soil loss. Compaction is key of the restoration areas.

If you should have any comments or questions regarding this information, please do not hesitate to contact me.

Sincerely,

Tetra Tech

James R. Warner, P.E.
Project Manager

JRW/slm/05.0198.000/corresp/APAFR Report.doc

C: Brian Watson
Cynthia Brown
Laura Maskry
Roger Grebing
Larry McLain

EROSION CALCULATIONS FOR NORTH MOUT AREA

Annual Runoff Volume (acre feet) =

Acres x Inches of Mean Annual Rainfall (inches) x C x 1 foot/12 inches

C = a coefficient determined by tables in *Evaluation of Current Stormwater Design Criteria within the State of Florida: Final Report. Florida Department of Environmental Protection FDEP Contract No. SO108* reflecting soil water absorption, rainfall amount and intensity by area in Florida, and percent developed land.

1) Baseline Conditions for the North MOUT:

C = 0.079

$$\frac{157 \text{ acres} \times 50'' \times 0.079}{12} = 51.68 \text{ acre feet water}$$

2) Development Under Proposed and Alternative Actions:

C = 0.071

$$\frac{157 \text{ acres} \times 50'' \times 0.071}{12} = 46.45 \text{ acre feet water}$$

3) Percent Runoff Increase

$$\frac{67.9 \text{ increase acre feet} - 51.56 \text{ baseline acre feet}}{51.56 \text{ baseline acre feet}} = 31.7\% \text{ increase}$$

APPENDIX D Preliminary USFWS Survey of the Project Area.

Avon Threatened and Endangered Species Checklist.

Project Name: South Military Operations Urban Training (South MOU) Expansion

Date: 10/05/2007

Location and other info: approximately 8 acres of disturbance in Echo Range

Species	Species Confirmed present	Species Possibly Present	Species Absent	Suitable Habitat On site	Suitable Habitat Nearby	No Habitat	No Effect	Adverse Effect Unlikely	Adverse Effect Likely
Red cockaded woodpecker			Y			Y	Y		
Florida scrub-jay			Y			Y	Y		
Florida grasshopper sparrow		Y			Y			Y	
wood stork			Y			Y	Y		
Audubon's crested caracara		Y			Y		Y		
bald eagle		Y			Y		Y		
Everglades snail kite			Y		Y		Y		
Florida panther		Y			Y		Y		
Eastern indigo snake		Y		Y				Y	
sand skink			Y			Y	Y		
blue-tailed mole skink			Y			Y	Y		
Highlands Tiger beetle			Y			Y	Y		
wireweed			Y			Y	Y		
Pigeon Wing			Y			Y	Y		

Note: this checklist is intended as an aid in determining the potential effects of proposed actions on threatened and endangered species which occur, or could potentially occur, on Avon Park Air Force range. In each box a "Y" (yes) or "N" (No) should be inserted. For example a "Y" in the No Effects box indicates that the project will have no effect on the species in question.

Narrative: Red cockaded woodpecker (RCW): No active or inactive territories occur in or near the project location the nearest active territory is approximately 3 miles northeast of the project site. No disturbance to RCWs or their habitat is anticipated. A finding of “no effect” can be supported.

Florida scrub-jay (FSJ): Active FSJ territories and suitable oak scrub habitat occurs approximately 2.5 miles northeast of the project location. No disturbance to FSJs or their habitat is proposed. A finding of “no effect” can be supported for FSJs.

Florida grasshopper sparrow (FGS): No active FGS territories occur near the project site. Singing males and FGS nests have been documented in and around the project site (see attached map). The proposed action may affect FGS by reducing the amount of acreage available for FGS foraging. Based on available data it appears that FGS nesting and breeding activities occur at least 1000 feet from the edge of the South MOUT. The proposed action may affect the prairie plant community and reduce opportunity for future FGS expansion.

Use of crushed tile or brick instead of shell is recommended to reduce the risk of exotic plant colonization. Also consider reseeding disturbed areas with a mix of native herbaceous prairie plants if feasible. This will reduce the cover of weedy species on site.

Wood stork: Wood storks may occasionally fly over the project, however no wetland areas are present in the immediate area. Due to the wide ranging nature of the species and the small project footprint a finding of “no-effect” can be supported.

Bald eagle: No suitable habitat for bald eagle occurs in or near the project location. Bald eagles may occasionally fly over the project site and may forage near the site when large carrion is present. Due to the wide ranging nature of bald eagle and small project footprint a finding of “no-effect” can be supported.

Audubon’s crested caracara: Suitable habitat occurs in and near the project site. Crested caracaras may occasionally fly over the site and may forage near the site when carrion is present. Due to the wide ranging nature of the species and the small project footprint a finding of “no-effect” can be supported.

Everglades snail kite: No suitable habitat for snail kite occurs in or near the project location. Snail kites may occasionally fly over the project site. Due to the nomadic nature of snail kite and the relatively small size of the project a finding of “no-effect” can be supported.

Florida panther: The species has been documented in Avon Park Air Force Range. Florida panther is very rare and wide-ranging. Due to the small footprint of the project relative to the home range of a panther a finding of “no-effect” can be supported.

Eastern indigo snake: Suitable habitat is present in and around the project location. Indigo snake is a wide ranging species; with home ranges of up to 550 acres.

Implementation of standard protection measures for eastern indigo snake; see attachment (Source: US Fish & Wildlife Service, Vero Beach Ecological Services Office) is recommended.

Wireweed and pigeon wing: No suitable habitat for these plants occurs in or near the project location. A finding of “no-effect” can be supported.

North MOUT Gopher Tortoise Survey Report

Participants: Mr. Mark Fredlake (USFWS liaison), Mr. Brent Bonner (APAFR GIS Program Manager), and myself, Mr. Tod Zechiel (APAFR NEPA Program Manager).

Date: 11 October 2007.

Objective: To effectively investigate the project area of the North Urban Village (aka North MOUT) for gopher tortoise burrows. This area is proposed for disking the ground surface to bare mineral soil to establish additional buildings and new roads for a mock village used for ordnance deliveries, aerial gunnery practice, and ground troop training in an urban setting.

Survey Time: 0930 to 1015.

Survey Location: T 32S, R30E, Sec 11 NW1/4 NW1/4

Method: Three people walked in line formation at 10 meters apart from each other – a 30 meter swath. The three individuals walked in north to south/ south to north swaths. The survey method followed that of the Florida Fish and Wildlife Commission in the *Gopher Tortoise Management Plan* dated May 2007. When a gopher tortoise burrow was found, all participants stopped, evaluated if the burrow would accommodate an indigo snake, and if so, it was logged in a global positioning unit (GPS). The area surveyed was approximately 1.5 acres. Burrows with debris or vegetation growing in the entrance were recorded as inactive, while those having clear entrances were recorded as active.

Results: Three active and three inactive burrows were located within the project area. Their locations are shown on the attached map. The burrows tended to be located on slightly elevated mounds with palmetto cover.

Report filed by Tod Zechiel on 31 October 2007.



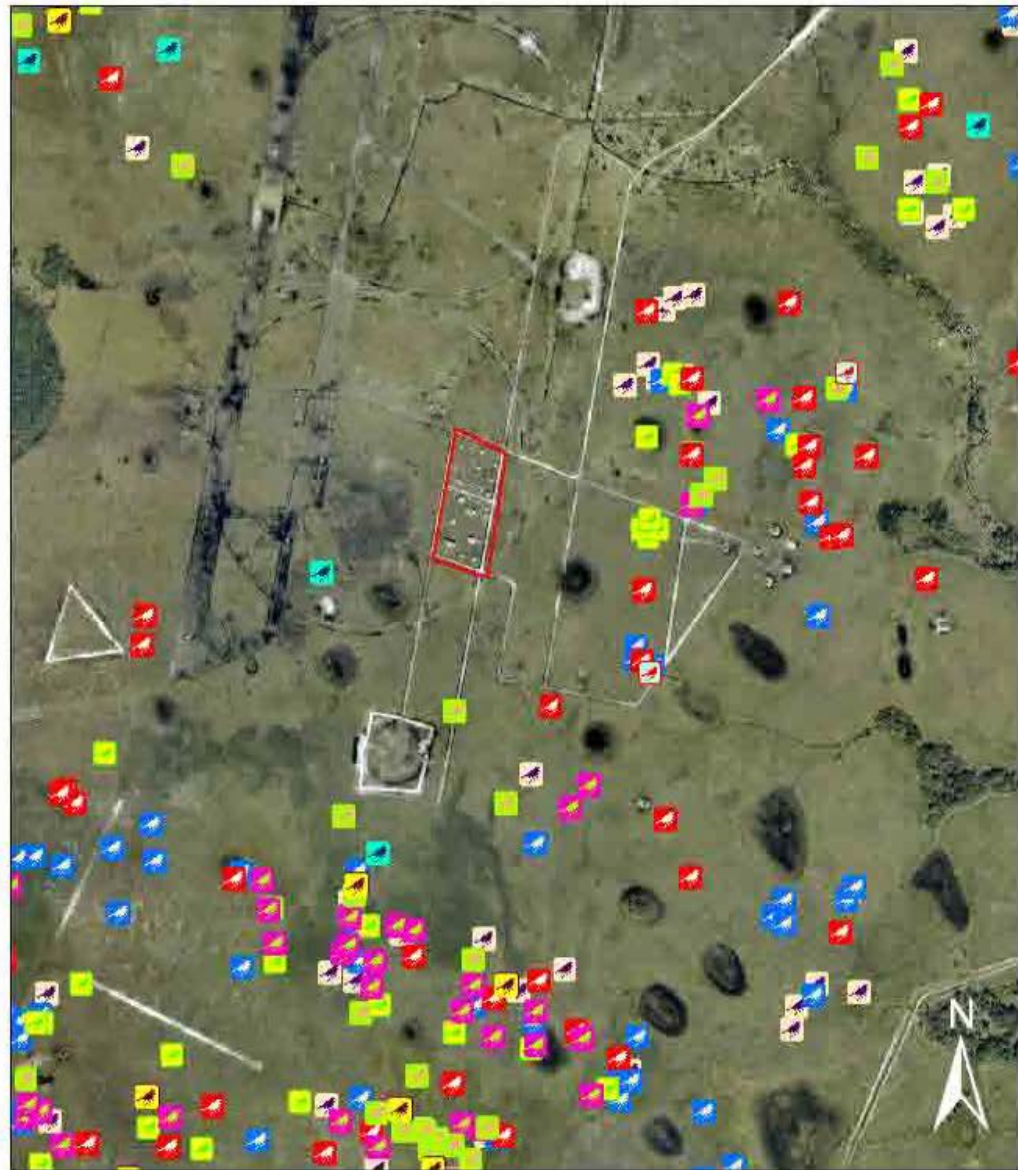
**Avon Park AFR
N MOUT Expansion
Tortoise Burrow Survey**

Tortoise Burrows

- ⓑ Active
- ⓑ Inactive
- ⓧ Other
- Survey Area/Project Area

Printed 31 October 2007
C:\GIS\mxd\

Locations of singing FL Grasshopper sparrows and nests near South MOUT



Legend

